

POPULAR SCIENCE

MONTHLY
MECHANICS AND HANDICRAFT



Power Tools for Home Builders - p.135

25¢

November



500-Lb. Car for \$500

PAGE 104

Here's Easy High-Speed Self-Instruction in all 25 Useful Branches of **Mathematics**

**to help you qualify for a bigger,
better job in any business or industry!**

Brought to You by 28 Leading Experts from Columbia, M.I.T., Cornell, Carnegie Tech., Georgia Tech., Many Others! The Simplified Course Used by Over 100,000 Men in Shop, Field and Office!

No One University Ever Could Proclaim Such a Distinguished Group of Mathematicians!

GENERAL EDITOR—R. S. Kimball, Ed. D. Formerly instructor at N. Y. U. Nationally famous organizer of courses in Mathematics for War Service.

Mass. Inst. Technology
Norbert Wiener, Ph.D.
Vice-Pres. American
Mathematical Society, Bocher Prize Winner.

Columbia Univ.
Edw. Kasner, Ph.D.
Member, Committee on
Mathematics National Research Council.

Carnegie Inst. Tech.
Lloyd Lyne Dines, Ph.D.
Head of Dept. of Mathematics.

Rensselaer Poly Inst.
James McGiffert, C.E.,
Ph.D. Member, Editorial
Board National Mathematics Magazine.

Princeton Univ.
Norman J. Sollenberger,
M.A. in C.E. Asst. Prof.
of Civil Eng. Head of
Materials Testing Laboratories.

Fordham University
Walter A. Hynes, Sc.D.
Assoc. Prof. of Analytic
Chemistry.

Northwestern Univ.
David Raymond Curtiss,
Ph.D. President, Mathematical Association of America.

Stevens Inst. Tech.
Robert Baker, B.S. Asst.
Director War Industries
Training School.

Cornell Univ.
Ralph P. Agnew, Ph.D.
Head of Mathematics Dept.

Univ. of Chicago
Lawrence M. Graves,
Ph.D. Professor of Mathematics.

Georgia School Tech.
Ralph A. Hefner, Ph.D.
Professor of Mathematics.

University of Notre Dame
Karl Menger, Ph.D. Prof.
of Mathematics, Vice-President International Congress of Mathematics.
Paul M. Pepper, Ph.D.
Assoc. Prof. of Mathematics.

University of Ill.

O. K. Bower, Ph.D. Asst.
Prof. of Mathematics.

Pratt Institute

Otis Benedict, Jr. Assoc.
Prof. Machine Shop Practice.

Calif. Inst. of Tech.

William W. Michael, B.S.
in C.E. Head of Dept. of
Civil Engineering.
William H. Pickering,
M.A. in E.E., Ph.D.
Assoc. Prof. of Electrical
Engineering.

U. S. Naval Academy

Sebastian B. Littauer,
C.E., D. Sc. Formerly Instructor at Annapolis;
Now on Engineering Staff,
Bendix Radio.

R. C. A. Institutes

George F. Maedel, E.E.
Chief Instructor N. Y.
School of R.C.A. Institutes.

Univ. of Michigan

Carl H. Fischer, Ph.D.
C. J. Nesbitt, Ph.D.
Asst. Prof. of Mathematics.

Univ. of Pennsylvania

Wharton School of Finance
and Commerce.
Jeremiah Lockwood,
Ph.D. Head of Accounting Dept.
Edward N. Wright, Ph.D.
Assoc. Prof. of Accounting.
Oscar S. Nelson, Ph.D.
Assoc. Prof. of Accounting.

Univ. of So. Calif.

Park J. Ewart, Ph.D.
Head of Dept. of Finance.
Kenneth L. Trefftz,
Ph.D. Asst. Prof. of Finance.

Stanford Univ.

Vern James, Ph.D. Graduate School of Business.

Now Yours at an AMAZING BARGAIN in these Four Books!

Nearly 1300 Pages! Over 600 Helpful Pictures and Diagrams!

CCLIMAXING its achievements in adult education, WM. H. WISE & Co. offers you—at amazingly low cost—a new streamlined Course in Mathematics especially designed to answer the thousands of urgent calls from industry for mathematically trained men in virtually every field!

On work bench, in drafting room; in the laboratory; in tool die and pattern making; in construction and engineering of all kinds; there's hardly a field where a mathematically trained man hasn't a decided advantage. He gets the better job—bigger pay—wins promotions quickly—and enjoys greater security through all his earning years—even during periods of change.

This New Wise Course in Mathematics makes it possible for the average person to acquire—in only a few months—a practical working knowledge of all 25 branches of mathematics and their practical applications. It comes to you complete in four volumes filled with illustrated, fascinating lessons designed for home study.

You receive instruction from 28 foremost instructors chosen from outstanding universities. Each instructor has been selected because of his special knowledge of a particular branch of mathematics and because of his ability to simplify and streamline his instructions.

The PRACTICAL MATHEMATICS Library

**Give You a Solid Foundation for Greater Earnings
Throughout Your Life—in Virtually Any Field!**

NO previous mathematics knowledge is needed under this ingenious teaching plan. You start with Basic Arithmetic and proceed by easy stages to an understanding of the most advanced branches of mathematics.

You learn how to use Algebra for short cuts in daily shop problems, in construction work, in tool and die making, in welding, sheet metal work and pattern making, in office and

laboratory. You'll learn how to apply Geometry in chemistry, mechanics, electricity and radio, in the drafting room. You'll learn how to employ Trigonometry in gearing, lathe centers, blueprints, die punches, etc.; in range finding, aviation, navigation. You'll learn how to utilize Calculus in the design and production of ships, dams, bridges, motors. You'll learn Practical Application that you can use to win advancement and bigger pay.

(Continued on opposite page)

Self-test problems with answers prove your progress to your satisfaction at every step of the way!

MAIL THIS FREE-TRIAL FREE-GIFT COUPON

Hundreds Send UNSOLICITED Praise!

"Wouldn't part with my set for less than \$50!"—
R. L. P., S. Norwalk, Conn. "I have benefited from
your Practical Mathematics Course—in my work, as
well as enjoyment. Worth many times its cost."—
J. G., Detroit, Mich. "You make it easy to learn."
—C. F. C., Detroit, Mich. "These books cover every-
thing!"—A. J., Washington, D. C.



FREE! This 160 Page Book
Amazing Mathematical
SHORT-CUT TO CORRECT ANSWERS

Contains Exactly the Same Invaluable

Time and Labor
Saving Loga-
rithm Tables as
Books selling as
High as \$4.50

This book of
Logarithms is
the greatest
short-cut ever
devised for
quick and easy
multiplying, di-
viding and all
other calculat-
ing. Easier to
learn; gives an-
swers quickly
and far more
accurately than
any Slide Rule.
A complete ex-
planation of the
use of loga-
rithm tables is
given. So simple



you can grasp it and begin to apply it in a
few minutes. Covers logs for all numbers to
the 6th place; contains much additional in-
formation including a table of circular arcs.
Invaluable for mechanics, scientists, busi-
nessmen, etc. **FREE** even if you return the
Mathematics Library!

Yours for FREE TRIAL

Normally, mathematical training as com-
prehensive as these 25-Courses-in-1 would
cost you hundreds of dollars and years
of study. Now you get it in these 4
volumes at a small fraction of the cost
and time! Test this Course at our risk
and expense. Mail coupon at right—get
the set for a week's **FREE** Examination.
After a week you may return it and owe
nothing; however, if you are thoroughly
convinced that it can help you advance
to bigger earnings, keep it at the incred-
ible bargain price and easy terms shown
in coupon. **But you must ACT NOW!**
This edition is limited in quantity.
Copyright 1951, Wm. H. WISE & CO.,
Inc., 50 W. 47th St., New York 19, N. Y.

28 Foremost University Experts Bring You Easy Mastery Of All 25 Branches
of Mathematics for Use in Every Field! Here's Partial List of Contents:

1. BASIC ARITHMETIC

Shop short-cuts, quick appli-
cations of addition, subtrac-
tions, etc.

2. ADVANCED ARITHMETIC

Percentage, fractions, ratio,
rapid calculation.

3. BASIC ALGEBRA

Industrial and technical
short-cuts; formulas, etc.

4. ADVANCED ALGEBRA

Practical use of simultaneous
equations, graphs, etc.

5. PLANE GEOMETRY

How to measure angles,
areas, distances, etc.

6. CONIC SECTIONS

Determining path of a shell,
design of auto headlights, etc.

7. SOLID GEOMETRY

Interpreting blueprints, co-
ordinate points in drawing,
etc.

8. TRIGONOMETRY

Calculating distance; theodo-
lites and sextants. Vernier
scale, etc.

9. LOGARITHMS AND SLIDE RULE

Short-cut operations in engi-
neering problems.

10. THE CALCULUS

Solves problems that can be
solved in no other way.

11. DIFFERENTIAL EQUATIONS

Determining rate of disinte-
gration of radio-active sub-
stances; population increase
or decrease, etc.

12. MENSURATION

Measurement of angles;
torque, density, tolerances,
etc.

13. STRUCTURAL ENGINEERING

Producing a finished struc-
ture; stresses; equilibrium,
etc.

14. MACHINE-SHOP PRACTICE

Computing cutting speeds for
lathe, drill press, etc.

15. HEAT

Controlling heat, expansion,
specific and latent heat, etc.

16. CHEMISTRY

Equations, decomposition, re-
placement, etc.

17. HISTORY OF MATHEMATICS

Pythagoras, Euclid, Archi-
medes, the geniuses of today.

18. ELECTRICITY

Measurements; resistances;
capacitance, time constants,
etc.

19. MILITARY GUNNERY

Range-finding; direction; t-
jectory; variables, etc.

20. NAVIGATION AND AERIAL NAVIGATION

Plotting a course; Mercator
chart, great-circle sailing,
drift, etc.

21. RADIO AND TELEVISION

Amplifier stages, tank cir-
cuits, television and h-
frequency transmission, etc.

22. LIFE INSURANCE

Annuities; compound inter-
est; mortality tables; de-
bends, etc.

23. ACCOUNTING

Debits and credits, discoun-
ts, sinking fund; profit and lo-
ss, etc.

24. FINANCE

Capital financing, chain of
accounts, bonds, etc.

25. BUSINESS STATISTICS

Business cycle, index num-
bers, flow-charts, etc.

THE ABOVE IS ONLY A SMALL FRACTION OF THE SUBJECTS COVERED!

FREE-TRIAL AND GIFT COUPON

WM. H. WISE & CO., Inc., 50 West 47th Street, New York 19, N. Y.

Without obligation to me, ship me prepaid for a week's **FREE** examination the com-
plete "PRACTICAL MATHEMATICS LIBRARY" in 4 volumes of 1280 pages. After a
week's **FREE TRIAL** examination, I will either return the books and owe you nothing;
keep them and send you only \$2 a month until the bargain price of only \$9.80, plus a
cents postage is paid.

FREE GIFT!—Also ship me prepaid the 160-
page book "6-PLACE LOGARITHMS" to
keep entirely **FREE** even if I return the set!

**SAVE COST OF 5 LB. SHIPMENT
PLUS 30c CASH DISCOUNT.**

Send only \$9.50 with this cou-
pon as full payment. Same
return privilege, full refund
guaranteed.

☐ Check here to see De Luxe
Edition, Morocco-Grained Art-
craft. \$1 per volume extra. Same
terms.

MR.
MRS.
MISS

(Print plainly)

ADDRESS

CITY &
ZONE No.

STATE

VOLTA TORREY, EDITOR

Howard Allaway, MANAGING EDITOR

Howard C. Jensen, ART EDITOR

Harry Walton, MECHANICS & HANDICRAFT EDITOR

Hartley E. Howe, Frank Rowsome, Jr., ASSISTANT MANAGING EDITORS

ASSOCIATE EDITORS: Alden P. Armagnac, Devon Francis, Sheldon M. Gallagher, Richard Giovine, Kendall W. Goodwyn, Robert Gorman, Herbert O. Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

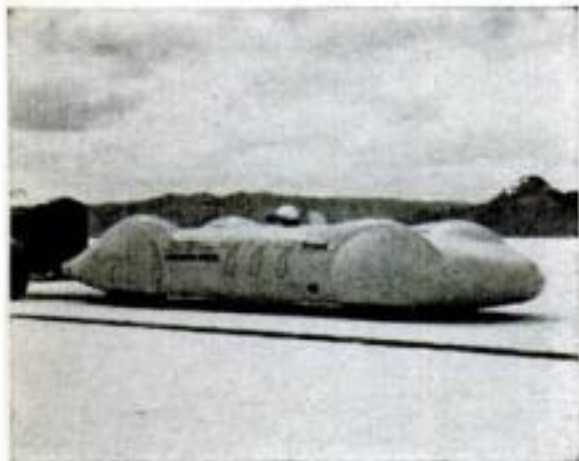
EDITORIAL ASSISTANTS: Julia C. Bove, Carol Ennis, Rita K. Gilbert, Rosemary C. Knorr, Georgette Sparks, Harriet Trowbridge, Ruth Westphal.

ART DIRECTOR: Harry Samuels. **ART ASSOCIATES:** Herbert Anthony, Rolf O. Erickson, Eric Karminski, Jr., Richard Meyer, Frances Cooper Daniels (Production).

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

*This Month's
Big Features:*



This may look like a glamorous racing car to you, but technically it's a hot rod. In fact streamlined No. 777 is the hottest hot rod of them all, with a proud run of 230 m.p.h. on the Bonneville salt flats in Utah. For a close-up of 777 and other hand-groomed aristocrats of the hot-rod world, see page 120.

Engineers Invade Another Wilderness.....	98
500-Lb. Car for \$500.....	104
Why Our Winters Are Getting Warmer.....	114
Shaw Drives the Minx.....	124
Portable Machines Build Houses Fast.....	135
How Rink Rollers Are Made.....	154
Is Your Car as Pretty as a Jeep?.....	161
How We'll Fly to Venus.....	172
How to Use Green Lumber.....	177
Saving Heat and Money.....	182
Starting Your Car in Zero Weather.....	189
Gus Gives the Air Force a Lift.....	196
New Poison Fools Rats.....	201
How to Service Your Auto Radio.....	216
Silicones in Your Home.....	221
How to Judge Used Power Tools.....	232

(More features and departments are listed on page 4.)

Godfrey Hammond, PUBLISHER · Stephen P. Glennon, ADVERTISING DIRECTOR

EDITORIAL OFFICES: 353 Fourth Avenue, New York 10, N. Y.

Ave.; CHICAGO—360 North Michigan Ave.; DETROIT—820 Book Bldg.; SAN FRANCISCO—681 Market St.; CLEVELAND—328 Citizens Bldg.; LOS ANGELES—1052 West 6th St.

ADVERTISING OFFICES: NEW YORK — 353 Fourth

Popular Science Monthly is published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter July 26, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1951, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada. \$3.00 (2 years, \$5.50; 3 years, \$7.50); foreign countries \$1 per year extra. Subscribers must notify us of change of address four weeks before next publication. Be sure to give both old and new addresses, including zone numbers. Vol. 159, No. 5.



Now! The greatest advance
in piston ring history! **PERFECT CIRCLE'S**

2 IN 1 CHROME PISTON RING SET

Doubles the life of cylinders, pistons and rings

IT'S TRUE! Perfect Circle's 2-in-1 Chrome Set is actually *two sets in one*, because . . .

First — two expander springs, Normal and HiPressure, are packed with every Chrome Oil Stopper . . . giving mechanics a choice of pressures to assure positive oil control regardless of cylinder condition.

Second — the protection of solid chrome plating against wear, on

BOTH top compression and oil rings, *more than doubles* the life of cylinders, pistons and rings!

Whether cylinders are slightly or badly worn, tapered or straight, round or out-of-round, it gives positive oil control with sustained power for thousands of extra miles.

Ask your Doctor of Motors — your favorite mechanic — to install the 2-in-1 Chrome Set in your car.



Perfect Circle

*The Most Honored Name
in Piston Rings*



...with these Wizards with Wood

Mending something that needs gluing? Making something that needs finishing? If it's made of wood, ask for Firzite, Satinlac and Weldwood® Glue at hardware, paint and lumber dealers—or mail coupon for leaflets.

Glue That's Stronger than Wood



To make things or fix things, use Weldwood Glue for all wood-to-wood bonds. Makes joints stronger than the wood itself. Mixes easily with water. Stain-free, rot-proof...highly water-resistant!

WELDWOOD®
PLASTIC RESIN GLUE

A MUST for Finishing Fir Plywood



Tame that wild grain with FIRZITE. Virtually prevents grain raise or checking...readies the surface satin-smooth for paint, stain or enamel. (For blond, pickled, or tinted effects on soft or hard woods, use White Firzite).

FIRZITE*

Newer than Shellac or Varnish



Pints, Quarts,
Gallons

For "natural wood" finishes on furniture, panelling or woodwork, there's nothing like Satinlac. Brings out natural grain and color beauty of any plywood or solid wood. Avoids that "built-up" look; will not turn yellow or darken with age. "Water-clear," easy to brush or spray, dries ready for next coat in 2 or 3 hours.

SATINLAC*

*Trade Marks

United States Plywood Corporation,
Dept. 337, 55 West 44th St., New York 18, N. Y.
Send me free leaflets on Weldwood Glue, Firzite
and Satinlac.

NAME _____

ADDRESS _____

Picture Features

Flivver Plane Totes Guns, Bombs.....	102
Germans Build Luxury Light Car.....	118
Champion Hot Rod Hits 230 M.P.H.	120
New Rifle Trigger Cuts Vibration.....	127
Private Railroad Rivals Big Lines.....	130
Is Russia Building These Speedsters?....	140
He Shoots Houses Out of a Gun.....	145
How a Thermostat Tends Your Furnace	148
Antique Toys Still Delight the Kids.....	158
Gas Pipe Taps Undersea Well.....	165
Pilotless Bomber Can Carry A-Bomb.....	168
Parking Meters Yield \$50,000,000.....	170
An Engine to Dream About.....	193

Mechanics & Handicraft

Carved Stool Needs No Carving Skill....	185
From Packing Box to Sewing Cabinet....	187
Winter Motoring Tips.....	195
A Sports Car for Christmas?.....	206
How to Stop TV Interference.....	210
One-Evening Shop Projects.....	212
Have You Tried a Fruit-Juice Can?.....	220
Get Bargains from a House Wrecker....	230
Slicked-Up Tools Work Better.....	237
Guarding Against Roof Ice Dams.....	239

Departments

Letters.....	10
Know Your Weapons.....	111
New Ideas from the Inventors.....	133
Aids to Modern Living.....	142
Keeping the Home Shipshape.....	151
I'd Like to See Them Make.....	160
P. S. Last Minute News and Notes.....	176
Hints from the Model Garage.....	199
Craftsmen at Work.....	205
New Tools.....	225
New Shop Ideas.....	228

NEXT MONTH...

Taking the Mystery Out of Drills



Here is the business end of a twist drill. If you have business with drills—and what craftsman hasn't?—you'll want to read a special article in the December issue. Besides lots of tips on drilling, the how and why of carbon versus high-speed, and what to do about the hole that starts in the wrong place, it gives down-to-earth instructions on sharpening drills all the way to No. 60.



Get 'em both with one stone

Here's how: By taking a regular I. C. S. course, you can now earn *bonus credits* toward a high school diploma.

If you've never finished high school, it's a double break for you. You get the training you want in the subject you want. The same practical I. C. S. training used by industry itself to train workers and recognized by employers everywhere.

In addition, and without extra study or cost, you can earn up to one-half the credits required for an I. C. S. high school diploma while studying any regular course.

These valuable *bonus credits* make it doubly worth-while for you to find out more about the I. C. S. course that interests you. Marking and mailing the coupon will bring you complete information. Send it off *today!*

Remember, you'll be killing two birds with one stone.

INTERNATIONAL CORRESPONDENCE SCHOOLS

BOX 7691-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

- Business and Academic Courses**
- ☐ Accounting ☐ Advertising
 - ☐ Bookkeeping
 - ☐ Business Administration
 - ☐ Business Correspondence
 - ☐ Business Law
 - ☐ Cartooning
 - ☐ Certified Public Accounting
 - ☐ Commercial ☐ Commercial Art
 - ☐ Cost Accounting
 - ☐ Fashion and Book Illustration
 - ☐ Federal Tax ☐ First Year College
 - ☐ Foremanship
 - ☐ Good English ☐ High School
 - ☐ Higher Mathematics
 - ☐ Industrial Supervision
 - ☐ Motor Traffic
 - ☐ Personnel—Labor Relations
 - ☐ Postal Civil Service ☐ Retailing
 - ☐ Retail Business Management
 - ☐ Salesmanship ☐ Secretarial
 - ☐ Sign Lettering
 - ☐ Stenography ☐ Traffic Management
 - Aeronautics Courses**
 - ☐ Aeronautical Engineer's, Jr.
 - ☐ Aircraft Drafting and Design

- ☐ Aircraft Mechanic
- ☐ Engine Mechanic
- Air Conditioning and Plumbing Courses**
- ☐ Air Conditioning ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Refrigeration, Domestic
- ☐ Refrigeration & Air Conditioning
- ☐ Steam Fitting
- Chemical Courses**
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Food-Plant Sanitation
- ☐ Petroleum Production & Refining
- ☐ Plastics ☐ Pulp and Paper Making
- Civil Engineering and Architectural Courses**
- ☐ Architecture ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering

- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping
- Communications Courses**
- ☐ Electronics ☐ Practical Telephony
- ☐ Radio, General ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Television
- ☐ Telegraph Engineering
- Electrical Courses**
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician
- Diesel Engines Courses**
- ☐ Diesel Engines
- ☐ Internal Combustion Engines
- Mechanical Courses**
- ☐ Forging ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Machine Shop ☐ Mechanical Drafting

60th Anniversary

- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting ☐ Ship Fitting
- ☐ Tool Designing ☐ Toolmaking
- ☐ Welding—Gas and Electric
- Railroad Courses**
- ☐ Air Brake ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman
- ☐ Steam-Diesel Locomotive Engineer
- Stationary Engineering Courses**
- ☐ Power Plant Engineering
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering
- Textile Courses**
- ☐ Cotton Manufacturing
- ☐ Loom Fixing ☐ Rayon Manufacturing
- ☐ Textile Engineering
- ☐ Woolen Manufacturing

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Special tuition rates to members of the Armed Forces. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

NOW YOURS
AT VIRTUALLY

WHOLESALE PRICES

LOOK at these Amazing Bargains just in time for **CHRISTMAS!**

YOU enjoy 50% DISCOUNT for cash—because WE save 3 ways: 1. No credit or "dead beat" losses. 2. No fancy "Main St." rents. 3. Direct-to-consumer selling. No dealers. No jobbers. **RESULT:** you pay only 1/2 our regular credit price! Send check or money order for prompt free delivery or order C. O. D. plus postage. In either case, take 10 WHOLE DAYS to test, compare, appraise at OUR risk! Full price back QUICK if not delighted. **REMEMBER:** Thoresen sells only brand new, tested quality watches and quality gifts, or "surplus" defective watches. **CHRISTMAS DELIVERY ASSURED** on orders reaching us by Dec. 20th. (Shipped Air Mail-Special Delivery). For a merrier Christmas at lower cost to you, shop the Thoresen-Direct way! Thoresen Direct Sales, Dept. 7-M, 131 West 33rd St., New York 1, N. Y.

Thoresen's Precision Built Watches



1
\$5.95
SHOCK RESIST
Swiss Jewelled Movement
Super value! Has certain features usually found in very expensive watches. Drop it... bang it... hit it... has Swiss Shock Absorber device! Also: luminous numbers and hands, unbreakable crystal, handsome chrome plated case and accurate Swiss jewelled movement! Ideal boy's gift. Your low cash price \$5.95 plus 80c tax. total: 6.55.



2
\$6.98
Ladies
SPORTEX JEWELLED
Dainty watch for active women and girls, nurses, teachers, housewives, sportswomen, etc. With stands hard and numerals. Luminous hands and movement. Jewelled Swiss price: 6.98 Your cash-save price: 7.68 plus 70c tax, total: 7.68.



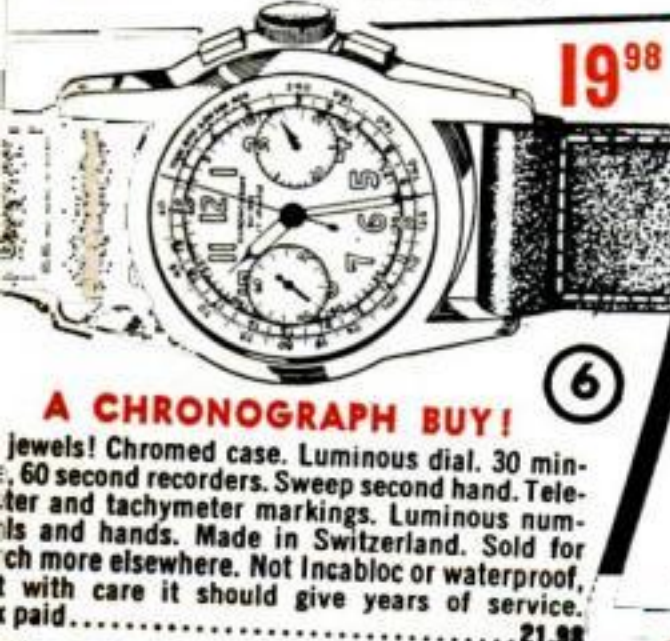
3
\$7.27
Electro
GOLD PLATED 7 JEWEL ACCURACY
MASTERPIECE of superb styling! Streamlined! Natural Gold Color. back in stainless metal. Luminous numbers and hands. Unbreakable crystal. Rugged construction for work & play. Real accuracy! Smart \$25.00 to you 7.27 Low cash price total—8.00, plus 73c tax, band given. Flex metal



4
Jet-O-Matic
FULL SWING SELF WINDING
Super De-Luxe Model—360° FULL-SWING AUTOMATIC. Just set it—then forget it! It winds itself as you wear it. Patented INCABLOC 17 Jewel movement of superb accuracy. WATER & SHOCK RESIST—you can drop it, bang it, even SWIM with it! 100% stainless steel screw-back. Radium Luminous Markings. Unbreakable Kieersite Crystal. Hairline Sweep Second. SPLIT-SECOND calibrations for precision timing. Handsome thin case. Smart. GILT numerals and hands. CAUTION: Do not confuse with inferior 180° HALF Swing automatic! Thoresen's Jet-O-Matic is 360° FULL SWING. It's the "high compression" self-winder! Makes ordinary watches old fashioned by comparison. Credit price only—\$55. Your CASH price—only 24.95 plus 10% Tax. Total—27.45. You SAVE 1/2 and also receive a \$4.95 COBRA Band!
LADIES' MODEL (Tiny, petite) Tax Paid, only **29.88**



5
1995
14 KARAT GOLD
PETITE LADIES WATCH
17 JEWELS! Precious 14 Karat Gold thru and thru! Amazingly accurate, yet so tiny! Made by reputable Swiss factory. Try to beat this sensational value anywhere in America. A thrilling gift for mother, wife, girl friend. De-Luxe band and gift case. Your low cash price only 19.95 plus 2.00 tax, total—21.95.



6
19.98
A CHRONOGRAPH BUY!
Jewels! Chromed case. Luminous dial. 30 min., 60 second recorders. Sweep second hand. Tele-ster and tachymeter markings. Luminous numerals and hands. Made in Switzerland. Sold for more elsewhere. Not Incabloc or waterproof. With care it should give years of service. Tax paid..... **21.98**



7
Low Cost 3 DIALS!
CHRONOGRAPH
NOW—at low cost watch that measures speed, time and even distances of autos, airplanes, horse races, sports, lab and photo work, etc. FEATURES: A dependable wrist watch—luminous hands & numbers—Sweep Second hand—45 minute dial—6 hour dial—records minutes, hours, seconds. 2 INDEPENDENT MOVEMENTS. Watch continues running while using stop-chronograph feature. Rugged construction with stands hard usage. Compare with other low cost chronographs selling for \$19.95. Our cash price only 7.85 plus 78c tax, total—8.64.

Give Thoresen's Titania Rutile the wonder gem of science...



8
More Brilliant than DIAMONDS

This Christmas give Thoresen's Titania Rutile Stones—the wonder Gem of Science! Readers Digest, The Saturday Evening Post and leading magazines has praised the sensational AMERICAN DISCOVERY of this laboratory-made gem that is actually MORE BRILLIANT THAN DIAMONDS! Now Thoresen brings it to you, in cut stones of one to five carats at less than 5% of the cost of African DIAMONDS! Yet it takes a JEWELER or DIAMOND SPECIALIST to tell the difference! In fact, PAWN BROKERS are warned against the possibility of making big loans on RUTILE, thinking they are lending on DIAMONDS! It's easy, even for an expert, to make this mistake, because Rutile has a refractive index approximately 10% HIGHER than diamonds and a far GREATER dispersion index than DIAMONDS! It's no wonder that thousands of folks now prefer rutile to diamonds! They enjoy terrific prestige, admiration and perhaps envy associated with precious jewelry and don't have to pay out hundreds or thousands of dollars.

ONLY \$10.00 PER CARAT!
We sell you the Stones in the size or shape you desire at only \$10.00, plus \$2.00 federal tax per carat! Thoresen's Titania Rutile comes in 1, 2, 3, 4, 5 carats in ROUND BRILLIANT, OBLONG EMERALD or OBLONG MARQUISE shapes. For your greater satisfaction we ask you to have your jeweler mount it in your old or a new setting of your choice, thus SAVING THE DIFFERENCE. Each stone is gift packaged and is accompanied by DESCRIPTIVE HINTS for mounting it YOURSELF in old settings or hand made jewelry! ATTENTION Jewelers, Pawnbrokers, Diamond Dealers: Order samples of these stones to AVOID DECEPTION as well as for setting in men's and ladies' rings at high profits.

ORDER YOURS NOW ON APPROVAL
Compare with select diamonds! Show your trusted jeweler, then, if not delighted, return within 10 days for quick refund. Thoresen's Titania Rutile gems are well made, fiery, brilliant—yet our price is only \$12.00 per carat, tax paid! Mention carat size and shape when ordering! Act now!

Send No Money!



9
Recipro-Register SPLIT-SECOND WRIST WATCH & CHRONOGRAPH

The wonder 4 in 1 watch
The ONE and ONLY genuine Recipro-Register CHRONOGRAPH—computes speeds and distances down to 1/5 of second! INCABLOC 17 Jewel Movement resists shocks of work and play. Remembers for you while movement continues to keep time! TIMES: Races, Planes, Sports, Photography, Shop Work, Lab Experiments, Lighting, etc. AUTOMATICALLY! 3 multi-function synchronized dials. Contact clutch starts computation. Brake clutch freezes result. Also ERASES back to zero. Radium dial, hairline sweep second, all stainless steel back, unbreakable Kieersite crystal. Don't confuse with cheap, troublesome chronographs. Remember: Recipro Register is INCABLOC equipped for ENDURING performance. Get the one and only genuine. Compare for precision with watches selling to \$100. Our low credit price—\$59.95. You SAVE 1/2 the Thoresen Cash-Save Way—only \$27.25 plus 10%, total \$29.98. GIVEN: Reg. \$4.95 Cobra Metal Band.

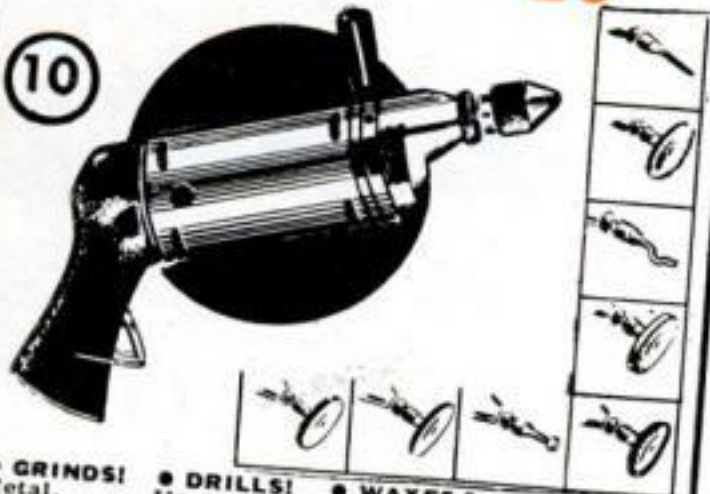
... YOU SAVE 50% THURESEN'S CASH SAVEWAY.

AMERICA'S GREAT POWER TOOL BUY!

38 Piece HI-POWER ELECTRIC TOOL KIT!

**The ultra-powerful tool
of 1000 uses**

\$18.95



● GRINDS!
Metal,
Glass,
Plastics,
Wood

● **DRILLS!**
Up to
1/4 inch!
Wood, Meta
Plastics!

● **WAXES & POLISHES**
Cars,
Furniture,
Linoleum.

● **SMOOTHS!**
Removes
rust &
paint,
varnish.

● **HONES!**
Tools,
Knives,
Lawn
Mowers

● MIXES
ANYTHING!
Paints,
Enamels,
All Liquids

• **BUFFS!**
Jewelry.
Silverware.
Metal
Items

• **SANDS!**
Wood,
Metal,
Plastics,
etc.

NOW yours at a "give-away" price—one of the most powerful and versatile electric hand and bench tool kits ever developed! Nothing left out! No expense spared! Includes famous "Hi-Power" 1/4" Portable Electric Drill, polished chrome finish with high speed air-cooled motor, auxiliary handle, automatic release trigger in handle, 7 high speed drill bits, polishing, sanding and grinding attachments, etc., etc. **GIVEN:** Steel bench stand and heavy gauge, custom-built steel case. Not just another drill, but a rugged power plant. Not just a years of satisfying service. **HIGH TORQUE AC-DC motor**, driven by a genuine at one low price—**18.95.** All 38 pieces yours

Try at our risk!



\$298

Leopard Design
AUTO SEAT COVER

WATERPROOF! STAIN RESIST!
TOUGH, LONG WEAR PLASTIC

Fit any car, any year, any model. Easy to install! No pins needed. Choice of covers for front or rear seat at only \$2.95—or set of 2 for both front and back seats for only \$4.95. These guaranteed seat covers are made to rigid Thorsen Specifications to give you utmost satisfaction and enduring service. Mention car model, year, make and if full front or split front seats.

FREE!
— EXTRA COST —
Christmas

FREE
OF EXTRA COST
Thoresen's Christmas
Gift to You!
Christmas, Thoresen's hands upon you

Thoresen & Co. Gift to 100,000

In the spirit of Christmas, Thoresen has prepared thousands upon thousands of gifts for its customers, such as: **Jewelry, Watches, Gadgets, Novelties, Calore**—Some worth up to **\$10.00**. To get yours, simply tear out and mail this coupon with your order! First come, first served. Your surprise gift is yours to **KEEP** or not! It's Thoresen's way of saying: "Thank you for your confidence and Merry Christmas to you!"

THORESEN'S Famous Guarantee
gives you **DOUBLE** protection!

Save with safety—the Thoresen **"DOUBLE" GUARANTEE** way. 1.—Try at **OUR** risk . . . test, compare, appraise, judge for yourself. Your purchase price back—**and pronto**—if not delighted. No risk or obligation for you! 2.—**UNLIMITED SERVICE GUARANTEE** exclusive of parts on all Thoresen watches. Repairs, if ever needed, made absolutely **FREE**. Never a charge for skilled labor, handling, adjusting, etc. This service cheerfully given you for the **LIFETIME** of this business! **BEWARE** of unscrupulous operators offering "redeemed" second hand watches. All Thoresen watches certified **brand new** and fully tested before shipment. **Rely on Thoresen's—the house that makes lifetime friends!** Address: **THORESEN DIRECT SALES, Dept. 7-N. 131 W. 33rd St., New York 1, N. Y.**



Gifts for the Workshop and Home



Palomino Horse Clock Artistic Triumph!

The gift that's sure to please! The **PALOMINO**—monarch of thoroughbreds... is here detailed elaborately, with exquisite artistic taste in sturdy Bronze color metal. Wins everyone's admiration! The horse surmounts an accurate, dependable 30 hour clock. Utility and decorative art combine to make this an ideal gift. Factory guaranteed! Thorsen brings it to you at an amazingly **LOW** price—only 7.95 plus 80c tax, total—**\$8.75.**



Imported Quality

A delightful, thoughtful gift that spreads Christmas Cheer the year round! "Aladdin's Lamp" lighter and the beautifully embossed tray are richly Silver plated. Lighter is press-lever automatic type that gives instant flame. Thorsen's Special Price direct-to-you **\$2.39**



NEW! Laboratory Tested! Heavy Duty!
PORTABLE GARAGE

PORTABLE GARAGE

The Ideal garage—it travels with your car—resists the ravages of snow, sleet, rain, sun, salt air, etc. Whisks on and off quick and easy. Folds away like a handkerchief. Takes little storage space. SURE-GRIP elasticized bottom offers complete security winter or summer. Pays for itself many times over.

Compare with ANY \$19.95 Garage. Do not confuse with inferior materials. **QUALITY** made of 100% **HEAVY**—the miracle Vinyl. Laboratory tested! Heavy Duty!

peeling
attention car make

Compare with ANY \$19.95 Garage
Do not confuse with inferior materials. Thoresen's is
QUALITY made of 100% HEAVY DUTY TRANS-KLEER
—the miracle Vinyl. Laboratory tested: Resists cracking
peeling Drying. Our price, only \$10.
Mention car make, year & model.

**Mail NOW for 10 day Trial
and CHRISTMAS GIFT!**

THORESEN DIRECT SALES, Dept. 7-M
131 West 33rd Street, New York 1, N. Y.

RUSH items checked by numbers below **ON APPROVAL** for 10 days, together with watch Service Guarantee, gift box and **CHRISTMAS GIFT**. If not delighted you are to return full purchase price at once. Christmas delivery guaranteed. **Check number of merchandise desired.**

Remittance enclosed. Send prepaid ☐ Send COD plus postage ☐
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐
7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐
12 ☐ 13 ☐ 14 ☐ 15 ☐

NAME _____

ADDRESS

TOWN

STATE

IMPORTANT: Send gift coupon with this order form to assure getting Thorensen's CHRISTMAS GIFT TO YOU. Rush order now.

Copyrighted material

In your Mind's Eye

The Secret of MENTAL CREATING

IF you just like to dream, read no further. There comes a time when your fancies *must be* brought into light—and stand the test of every-day, hard realities. Are you one of the thousands—perhaps millions—whose thoughts never get beyond the stage of *wistful wishing*? Do you often come to from a daydream with the sigh, "If only I could bring it about—*make it real*?"

All things begin with thought—it is what follows that may take your life out of the class of those who hope and dream. Thought energy, like anything else, can be dissipated—or it can be made to produce actual effects. *If you know how to place your thoughts* you can stimulate the creative processes within your mind—through them you can assemble things and conditions of your world into a happy life of accomplishment. *Mental creating* does not depend upon a magical process. It consists of *knowing how* to marshal your thoughts into a power that draws, compels and organizes your experiences into a worth-while design of living.

ACCEPT THIS *Free* BOOK

Let the Rosicrucians tell you how you may accomplish these things. The Rosicrucians (not a religious organization), a world-wide philosophical fraternity, have preserved for centuries the ancients' masterful knowledge of the functioning of the inner mind of man. They have taught men and women how to use this knowledge to *recreate their lives*. They offer you a free copy of the fascinating book, "The Mastery of Life." It tells how you may receive this information for study and use. Use coupon opposite.

The ROSICRUCIANS
(AMORC)

SAN JOSE

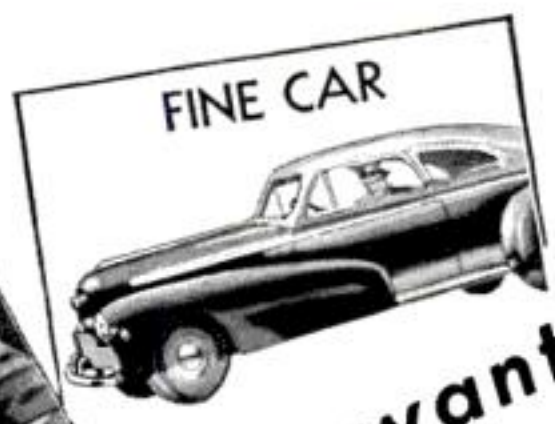
CALIFORNIA

SCRIBE: B.H.H.
The Rosicrucians (AMORC),
San Jose, California.
Please send free copy of "The Mastery of Life,"
and I shall read it as directed.

Name.....

Address.....

City.....



To the man who wants to enjoy an ACCOUNTANT'S CAREER

IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of \$4,000 to \$10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing*!

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex—soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

You cover accountancy from the basic Principles right up through Accountancy Systems and Income Tax Procedure. Then you add C. P. A. Training and prepare for the C. P. A. examinations.

As you go along, you absorb the principles of Auditing, Cost Accounting, Business Law, Statistical Control, Organization, Management and Finance.

Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Write For This Free Book

For your own good, don't put off investigation of *all* the facts. Write for our free 48-page book, "Accountancy, The Profession That Pays." It'll prove that accountancy offers brilliant futures to those who aren't afraid of serious home study. We'll also include "Ten Years' Promotion in One"—a book which has helped many men. Send us the coupon *now*.

Over 3500 Certified
Public Accountants among
LaSalle alumni

Other LaSalle Opportunities

- ☐ Higher Accountancy
- ☐ C.P.A. Coaching
- ☐ Bookkeeping
- ☐ Law: LL.B. Degree
- ☐ Business Management
- ☐ Salesmanship
- ☐ Traffic Management
- ☐ Foremanship
- ☐ Industr'l Management
- ☐ Stenotypy
(Machine Shorthand)

LASALLE EXTENSION UNIVERSITY A CORRESPONDENCE INSTITUTION

417 S. Dearborn St. Dept. 1183HR Chicago 5, Ill.

I want to be an accountant. Send me without obligation, "Accountancy, the Profession that Pays"—also "Ten Years' Promotion in One."

Name.....Age.....

Address.....

City, Zone & State.....





Clocking the Iron Horses

The August article "Highballing the World's Fastest Trains" [p. 79] mentioned three fast trains—two of Burlington's and one of Illinois Central's. It says that only these three go faster than 80 m.p.h. However, on the Chicago & North Western there is a streamliner—the "400"—that goes from Chicago to St. Paul, by way of Adams and Milwaukee. They have a speedometer on it that has gone well above 90 m.p.h.! They average three hours from Chicago to Adams (about 250 miles) and about three more from Adams to St. Paul (about 220 miles).

RALPH E. MAAS, Chicago

Our article evaluated train speeds in terms of averages. The Chicago & North Western's fastest train is the Commuter-Streamliner-Valley 400, which averages 78.3 m.p.h. between Kenosha and Waukegan.

Blow the Frost Down

On page 181 of your August issue, E. F. Lindsley suggests using the vacuum hose, attached to the blower end of the vacuum



cleaner, to speed defrosting the refrigerator. Since this hose is regularly used to suck dust from floors, it does not seem very sanitary to employ near food.

A better method would be to use a common, small electric hair dryer. Besides being cleaner and more compact, the warm air flow would do a quicker job of defrosting.

WALTER SCHMAND, Brooklyn, N. Y.

Brazilian Rope Trick

The same rope-pump device which the professors found so intriguing ["Rope Lifts Water Without a Bucket," PS, June '51, p. 77] is in general use throughout Brazil, us-

ing link-chain instead of rope, and frequently a geared hand-wheel instead of an electric motor.

STANLEY I. RATNER, Sao Paulo, Brazil

The Moose Is Mightier Than the Motor

The letter on "Signs" in your August issue reminded me of one I saw last summer while traveling through Maine. It definitely



told me I was no longer in the area of the cities I am used to. It read, "Danger, Moose Crossing!"

CYRIL KEENE, JR., Baltimore

Muntz Had Both Engines

In the article "Shaw Compares 3 Sports Cars" in the September, 1951, issue on page 87, Mr. Shaw states that he would like to see what the Muntz Road Jet would do with an overhead-valve engine.

But the November, 1950, issue of *Motor Trend* clearly shows a Muntz with a Cadillac overhead-valve engine instead of the Lincoln L-head.

Which motor is the car really powered by?

GARY HILDING, Paola, Kan.

The Muntz was originally powered by a Cadillac engine, has since switched to a Lincoln.

L-Head vs. Overhead Valves

... Shaw stated that the Muntz engine was an L-head, "almost obsolescent in today's high-compression market."

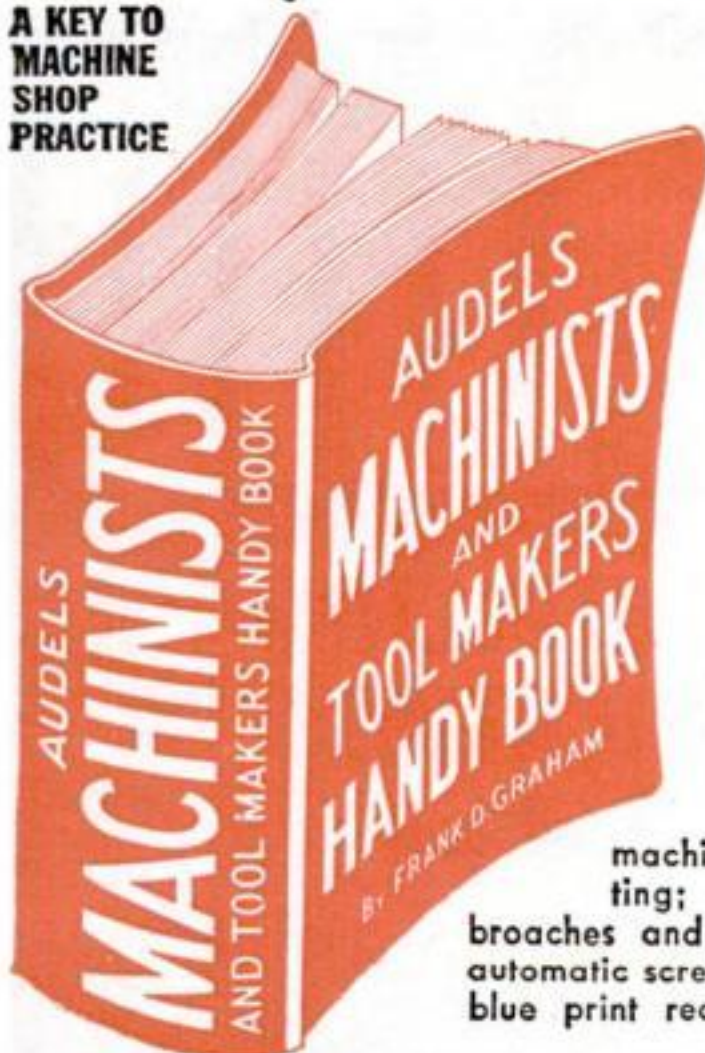
How come Ford-built L-head V-8s won the 1950 and 1951 Mobilgas Economy Runs? How can the same engine that is in Muntz' car drive a 5,000-lb. Lincoln at nearly 100 miles an hour? How can that same Lincoln engine in an F-8 Ford truck haul 30-40 tons around for 100,000 miles without major overhaul? Is there any stock engine on the market today that is more reliable than Ford L-head V-8s?

EUGENE C. LAMB, DeWitt, N. Y.

We agree that the L-head is a fine engine. Mr. Shaw feels that the overhead-

WHAT Every MACHINIST Wants to Know

A KEY TO
MACHINE
SHOP
PRACTICE



AUDELS MACHINISTS & TOOL MAKERS HANDY BOOK. A shop companion for every Machinist, Toolmaker, Engineer, Machine Operator, Mechanical Draughtsman, Metal Worker, Mechanic and Student. Covers Modern Machine Shop Practice in All Its Branches. Highly Endorsed.

SOLVES YOUR PROBLEMS—ANSWERS 1001 QUESTIONS

Here is some of the practical material you'll find on Machine Shop Practice. It starts with a simple explanation of shop measuring tools, how to measure, and how to lay out a job. Then it works up to more advanced subjects like:

Heat treating furnaces; bench work; how to operate a lathe, cutting screw threads; Jigs & fixtures; taps and dies; drilling machines and operations; vertical boring mills; horizontal boring machines; shapers; planers; slotters; milling machines; gears and gear cutting; grinders and grinding; broaches and broaching; dies; cams; automatic screw machines; tool making; blue print reading; shop calculations.

Sent on 7 Days Approval

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money. Nothing to pay postman.

CUT HERE MAIL ORDER

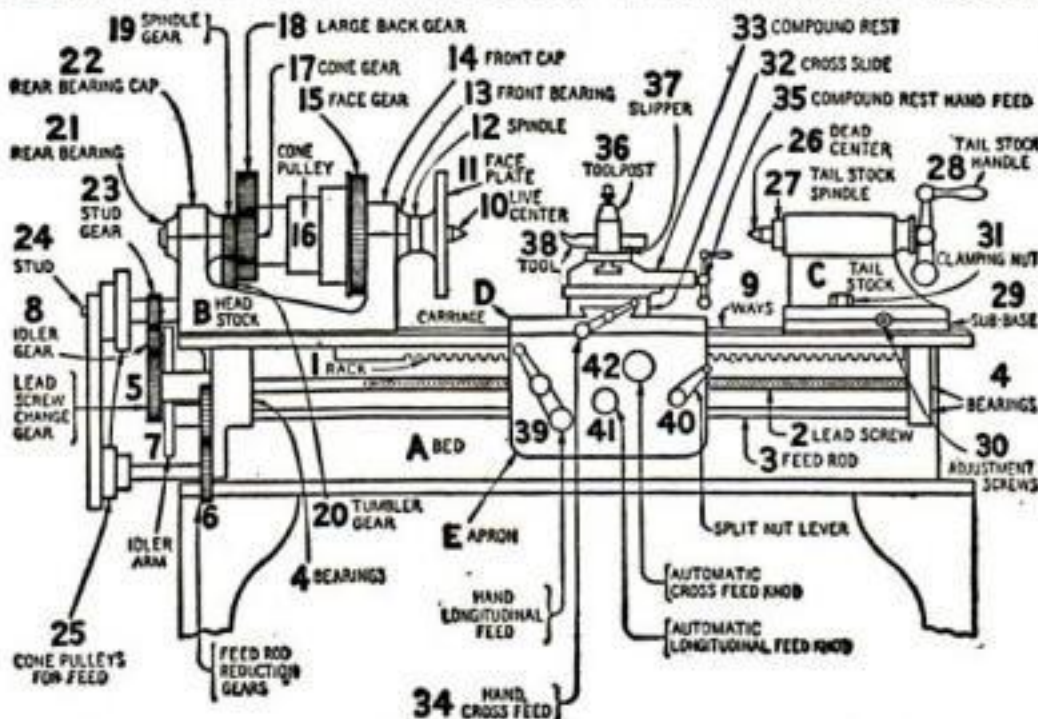
AUDELS, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me postpaid for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail \$1 in 7 Days on each book or set ordered and further mail \$1 monthly on each book or set until I have paid price, otherwise I will return them.

- ☐ MACHINISTS HANDY BOOK, 1650 Pages . . . \$ 4
- ☐ WELDERS GUIDE, 400 Pages . . . 1
- ☐ BLUE PRINT READING, 416 Pages . . . 2
- ☐ MATHEMATICS & CALCULATIONS, 700 Pages . . . 2
- ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages . . . 4
- ☐ SHEET METAL WORKERS HANDY BOOK, 388 Pgs. . . 1
- ☐ MECHANICAL DRAWING GUIDE, 160 Pages . . . 1
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages . . . 2
- ☐ AUTOMOBILE MECHANICS GUIDE, 1800 Pages . . . 4
- ☐ TRUCK & TRACTOR GUIDE, 1295 Pages . . . 4
- ☐ DIESEL ENGINE MANUAL, 575 Pages . . . 2
- ☐ AIRCRAFT WORKER, 240 Pages . . . 1
- ☐ TELEVISION SERVICE MANUAL, 346 Pages . . . 2
- ☐ RADIOMANS GUIDE, 914 Pages . . . 4
- ☐ ELECTRONIC DEVICES, 216 Pages . . . 2
- ☐ ELECTRIC MOTOR GUIDE, 1000 Pages . . . 4
- ☐ ELECTRIC WIRING DIAGRAMS, 272 Pages . . . 1
- ☐ ELECTRICIANS EXAMINATIONS, 250 Pages . . . 1
- ☐ ELECTRIC POWER CALCULATIONS, 425 Pages . . . 2
- ☐ HANDY BOOK OF ELECTRICITY, 1440 Pages . . . 4
- ☐ ELECTRIC DICTIONARY, 9000 Terms . . . 2
- ☐ ELECTRIC LIBRARY, 7000 Pages (12 Book Set) . . . 18
- ☐ MARINE ENGINEERS HANDY BOOK, 1258 Pgs. . . 4
- ☐ SHIPFITTERS HANDY BOOK, 250 Pages . . . 1
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. . . 4
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. . . 4
- ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages . . . 4
- ☐ ENGINEERS & FIREMANS EXAMS, 525 Pages . . . 1
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. . . 4
- ☐ ENGINEERS LIBRARY (3 Book Set) . . . 9
- ☐ MECHANICAL DICTIONARY, 950 Pages . . . 4
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) . . . 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) . . . 6
- ☐ PLUMBERS & Steamfitters Guides (4 Book Set) . . . 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) . . . 6
- ☐ PAINTERS & DECORATORS MANUAL, 450 Pgs. . . 2
- ☐ HOUSE HEATING GUIDE, 1000 Pages . . . 4
- ☐ OIL BURNER GUIDE, 384 Pages . . . 1

YOUR OPPORTUNITY

**A COMPLETE INSTRUCTOR—
1650 PAGES—FULLY INDEXED
FOR QUICK, READY REFERENCE
60 INTERESTING CHAPTERS
PRACTICAL INFORMATION IN A HANDY FORM**



SPECIMEN ILLUSTRATION—REDUCED IN SIZE



ASK TO SEE IT!
**TO GET THIS ASSISTANCE FOR YOURSELF
SIMPLY FILL IN AND MAIL ORDER TODAY**

**\$4 COMPLETE
PAY \$1 A
ONLY 1 MO.**

AUDELS, Publishers, 49 W. 23 St., New York 10, N. Y.

Name _____
Address _____
Occupation _____
Employed by _____

I Trained These Men



E. J. STREITENBERGER, New Boston, O., says, "After completing your training course, I made a week fixing sets in my spare time. Now set Television sets."



PHILLIP G. Louisville 8, K have been operating Servicing business years I did \$14 business; net p



S. W. DINWIDDIE, ville, Ill., writes, "S finishing course, wo servicing shop. No Engineer of WCUN Police Radio Instal



A. HERR, New C Pa., writes, "Have doubled my salary since starting in Radio full time. Am employed by Station WKBO as transmitter operator. Future looks bright to me."



L. HAUGER, San Bruno, Calif., tells us, "I accepted a position as Radio and Television Technician . . . promoted to manager of Television Service and Installation."



LEANDER ARNOLD, Pontiac, Mich., says, "While learning, made \$5 to \$10 a week repairing Radios in my spare time. Now I have a spare time shop in my home."



NORMAN H. WARD, Ridgefield Park, N. J., writes, "4 years ago, I was a bookkeeper with a hand-to-mouth salary. Now I am employed by a key ABC station."



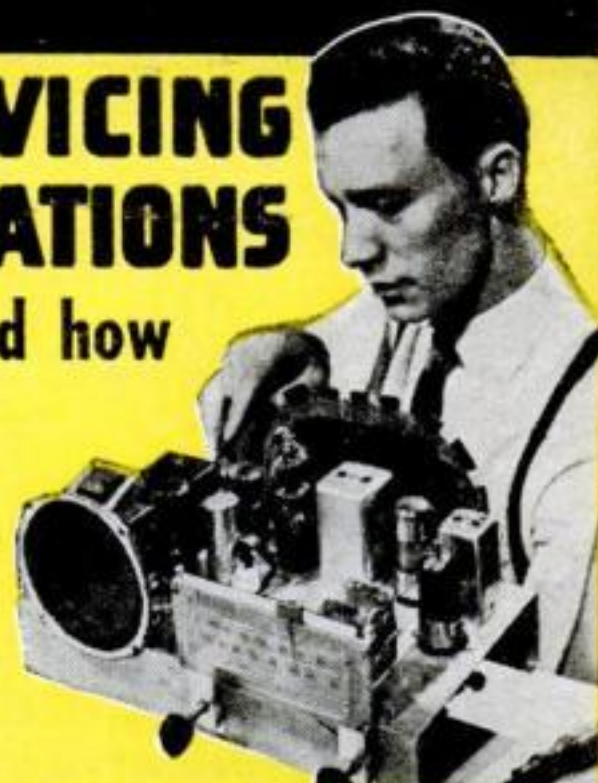
I'll Train You RADIO-

PRACTICE SERVICING OR COMMUNICATIONS

with kits you get—Read how

For both my Servicing Course and my Communications Course, I send you many Valuable Kits of Parts for **PRACTICAL EXPERIENCE**. They "bring to life" theory you learn in my illustrated texts. Some equipment from both courses is shown below. As part of my Servicing Course, you build a complete, powerful Radio Receiver, a Multitester useful in earning extra spare time money, an A.M. and F.M. Signal Generator, etc. In my Communications Course, you

assemble a low-power Broadcasting Transmitter that shows how to put a station "on the air," a Wavemeter, and an Electronic Multitester for measuring voltage, current, resistance, impedance, etc. This and other equipment you build with Kits I send is yours to keep.



Make Extra Money in Spare Time While Learning

Many of my students earn money fixing neighbors' Radios in their spare time while learning, often average \$5, \$10, a week. I send you **SPECIAL BOOK-LETS** that show you how to do it . . . and I send parts to build a Multitester that helps you do it.



NEW! Advanced Television Practice!

New, special TV kits furnished to build high-definition **SCOPE . . . RF OSCILLATOR** with flyback power supply . . . complete TV SET . . . many other units. You see pulse, trapezoidal, saw-tooth wave forms. Get valuable **PRACTICAL EXPERIENCE** locating and correcting TV troubles. Mail coupon for facts, pictures and prices!

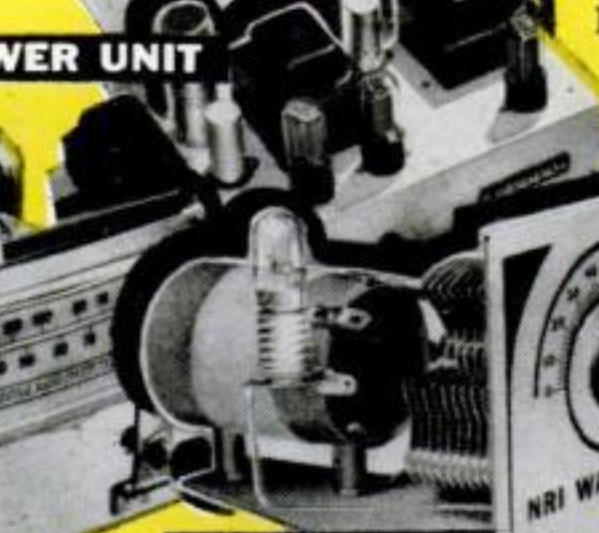


SIGNAL GENERATOR

POWER UNIT



MODERN RADIO



WAVEMETER



MULTITESTER

AT HOME for Good Jobs in TELEVISION

There is Success--Good Pay--Security for You in America's Fast Growing Industry

EXTRA PAY IN ARMY, NAVY, AIR FORCE

Knowing Radio, TV, Electronics can help you get extra rank, extra prestige, more interesting duty at pay up to several times a private's base pay. You are also prepared for good Radio-TV jobs upon leaving service. Mail coupon TODAY!

Want Your Own Business?



Many N.R.I.-trained men operate successful Radio-Television sales and service businesses. Let me show you how, starting with spare time earnings as their capital, they build good incomes from their own shops.

DO YOU want good pay, a job with a bright future and security? Would you like a profitable shop of your own? The fast growing, prosperous RADIO-TELEVISION industry is making these opportunities for you. Radio alone is bigger than ever, 90 million home and auto Radios, 3100 Broadcasting Stations, Two-Way Radio for buses, taxis, etc., are making opportunities for Servicing and Communications Technicians and FCC-Licensed Operators.

Television is TODAY'S Good Job Maker

In 1946 only 6,000 TV sets sold. In 1950 over 5,000,000. By 1954, 25,000,000 TV sets will be in use, according to estimates. Over 100 TV Stations are operating in 35 states. Authorities predict there will be 1,000 TV Stations. This means new jobs, more jobs, good pay for qualified men.

Many Soon Make \$10 A Week Extra in Spare Time

Keep your job while training at home. Hundreds I've trained are successful RADIO-TELEVISION TECHNICIANS. Most had no previous experience; many no more than grammar school education. Learn Radio-Television principles from illustrated lessons. Get PRACTICAL EXPERIENCE. See on the opposite page some of the devices my students build from Kits of Parts I furnish; also practice servicing

ing Radios or operating transmitters—experiment with circuits common to Radio and Television. You keep all equipment. Many students make \$5, \$10, a week extra fixing neighbors' Radios in spare time. SPECIAL BOOKLETS start teaching you the day you enroll.

Send Now for 2 Books FREE—Mail Coupon

Act Now! Send for my FREE DOUBLE OFFER. Coupon entitles you to Sample Lesson on Servicing; shows how you learn Radio-Television at home. You'll also receive my 64-page book, "How to Be A Success in Radio-Television." You'll read what my graduates are doing, earning; see photos of equipment you practice with at home. Send coupon in envelope or paste on postal. J. E. Smith, President, Dept. 1MB, National Radio Institute, Washington 9, D. C. OUR 38TH YEAR.

Actual Lesson and 64 page Book BOTH FREE

The ABC's of SERVICING

How to Be a Success in RADIO-TELEVISION

Mail Coupon Now!

MR. J. E. SMITH, President, Dept. 1MB
National Radio Institute, Washington 9, D. C.

Mail me Sample Lesson and 64-page Book, "How to Win Success in Radio-Television"—both FREE. (No salesman will call. Please write plainly.)

NAME.....AGE.....

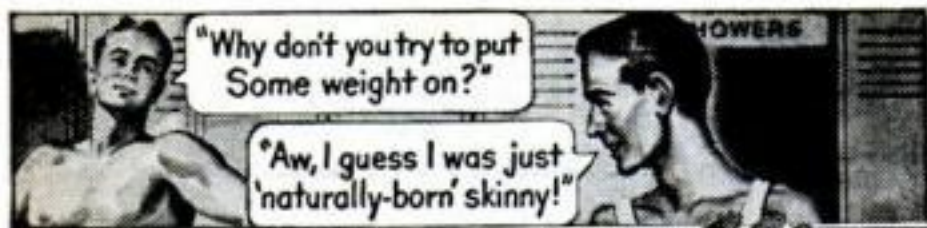
ADDRESS.....

CITY.....ZONE.....STATE.....

Approved Under G. I. Bill



TRANSMITTER



BUNK!

NOBODY IS JUST "Naturally" SKINNY!

Give Me 15 Minutes A Day And I'll
Give YOU A New Body

WOULD you believe it? I was once a skinny 97-pound weakling. I was ashamed to strip for sports or for a swim. Girls snickered at me behind my back. Folks said I was just "naturally-born skinny!"

Then I discovered my marvelous new muscle-building system—"Dynamic Tension." And it turned me into such a complete specimen of manhood that today I hold the title, "The World's Most Perfectly Developed Man."

WHAT'S MY SECRET?

When you look in the mirror and see a healthy, husky fellow smiling back at you—then you'll be astonished at how fast "Dynamic Tension" gets results! And you'll be using the method which many great athletes use for keeping in condition—prize fighters, wrestlers, baseball and football players, etc.

"Dynamic Tension" is the easy, natural method that you can practice in the privacy of your own room—just 15 minutes each day—while your scrawny chest and shoulder muscles begin to swell . . . those spindly arms and legs bulge . . . and your whole body starts to feel full of zip, self-confidence, new energy!

FREE My 48 Page Illustrated Book is Yours
—Not for \$1.00 or 10c—But FREE

Send NOW for my famous book, "Everlasting Health and Strength," 48 pages, packed from cover to cover with actual photographs, valuable advice, answers to many vital questions. Page by page it shows what I can do for YOU. This book is a real prize for any fellow who wants a better build. Yet I'll send you a copy absolutely FREE. Just glancing through it may mean the turning point in your whole life! Rush the coupon to me personally: **Charles Atlas, Dept. 1-L, 115 East 23rd St., New York 10, N. Y.**



Charles Atlas
Awarded the title of
"The World's Most Perfectly
Developed Man."

CHARLES ATLAS, Dept. 1-L
115 East 23rd St., New York 10, N. Y.

Send me—absolutely FREE—a copy of your famous book, "Everlasting Health and Strength"—48 pages, crammed with actual photographs, answers to vital health questions, and valuable advice to every man who wants a better build. I understand this book is mine to keep, and sending for it does not obligate me in any way.

Name.....Age.....
(Please print or write plainly)

Address.....

City.....State.....

valve engine is even better. The trend to overhead valves would seem to bear him out.

Jag Ambidextrous

The illustration of the Jaguar on your September cover and the photograph in the text did not coincide. The cover Jaguar was a right-hand drive, whereas the one in the text was a left-hand drive. Can the Jaguar be obtained with either the right- or left-hand drive, or was the illustrator at fault?

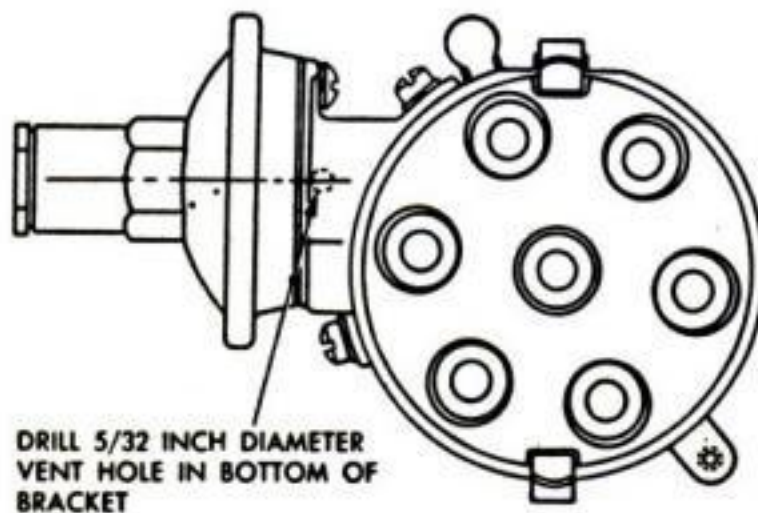
FRANK S. BEATTY, Denver

Although Jaguars are made in England, where everybody drives on the left, so many are now being exported to the U.S. (about 90 percent of present production) that nearly all have left-hand drive. Normally, you could get either drive, but if you want right-hand drive now, you have to put in a special order.

Dope on Distributor Caps

The former owner of my '49 Dodge tells me that he encountered the problem of a popping distributor cap, solved by Gus Wilson in your June issue. In the case of my car, however, the owner simply drilled a hole in the distributor cap to allow fuel vapor to escape—instead of installing a new vacuum unit as Gus did. Would it be best for me to replace my unit?

FRANCIS L. SAMHAMMER, Easton, Pa.



It would. The diaphragm in your vacuum chamber is undoubtedly punctured or the cap wouldn't have popped. Drilling the cap would let vapor escape, but the punctured diaphragm would keep manifold vacuum from retarding the spark when the engine is under load. Besides a new vacuum chamber, the Dodge people recommend drilling a 5/32" vent hole in the bottom of the distributor bracket if there's not already one in that spot. See the sketch above.



INVENTORS



Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

12-L DISTRICT NATIONAL BUILDING
WASHINGTON 5, D. C.



NOVEMBER 1951 15

a New World of Adventure

...at your fingertips!



U. L. Approved
S-38B

hallicrafters

NOW YOU CAN ROAM the far corners of the earth . . . at the touch of the dial on your *Precision HALLICRAFTERS* Radio.



HEAR EXOTIC MUSIC from Egypt . . . India . . . Morocco . . . dance to Samba bands from Havana or Rio—and thrill to the famous Royal Philharmonic direct from Covent Gardens in London.



NEWS FLASHES FIRST by short-wave radio—and you can tune in authentic, on-the-spot reports *direct* from the nerve centers of the globe . . . the chess-like diplomatic centers of Europe . . . the smoldering Middle East . . . the flaming Pacific.



THRILLS BY THE HOURS! Hear the Pope speaking right in the Vatican, the bells of Big Ben tolling the hour in *Parliament's* towers, the propaganda war shrieks from behind the Iron Curtain . . . and America's "Voice of Freedom" in 45 languages.



HALLICRAFTERS is the "Ham's" set, and he *knows* radio. Hallicrafters sells more short-wave radios than all other manufacturers combined. So, for years of pleasure . . . get a *Precision Hallicrafters*. Tunes in standard, short-wave, police, fire, airlines, and other communications wave-lengths.

S-38B AC-DC \$49.50

Write Dept. PS for name of dealer

HALLICRAFTERS • Chicago 24, Illinois

**WHOLESALE
BY MAIL**
GOOD USED TIRES
with a **GOLD BOND GUARANTEE**



Nationally Advertised Brands

12 Month GOLD BOND GUARANTEE							
600-16	\$4.16	700-16	\$5.06	700-15	\$4.56	710-15	\$4.96
650-16	4.66	650-15	4.46	670-15	4.76	550-17	4.66

24 Month GOLD BOND GUARANTEE							
600-16	\$5.56	650-18	\$6.96	820-15	\$7.06	825-20	\$19.98
650-16	5.96	650-15	5.96	475-19	5.96	900-20	20.45
700-16	5.96	670-15	6.26	600-20	9.95	1000-20	22.50
750-16	6.96	700-15	6.56	650-20	10.75	1100-20	22.50
550-17	5.96	710-15	6.36	700-20	12.45	1000-22	19.50
525-18	5.56	760-15	6.56	750-20	13.48	1100-22	20.25

MUD AND SNOW TIRES

12 Month GOLD BOND GUARANTEE			
600-16	\$6.50	900-16	\$10.50
		750-20	\$10.25

24 Month GOLD BOND GUARANTEE			
600-16	\$9.50	900-16	\$19.50
Special		750-20	Special \$18.50

ALL SIZE TRACTOR TIRES PRICES ON REQUEST

Send check or money order to Dept. 678

GOLD BOND TIRE COMPANY, P.O. Box 2175
1501 North 2nd Street RICHMOND, VIRGINIA

Gain Confidence and Success

**TAKE
HIGH
SCHOOL
AT HOME**

A high school diploma gives you *poise*; helps you get *better jobs, more pay!* Earn yours at home in spare time—in 18 to 24 months. C.T.I. course for adults equals *resident work*, saves time. Textbooks supplied. College prep. Credit for work elsewhere. Terms. Write for free details!

COMMERCIAL TRADES INSTITUTE, Dept. H1-11
1400 Greenleaf Avenue • Chicago 26, Ill.

HYPNOTIZE



Yes. Anyone. Mystify Friends. Authentic fascinating hypnotic feminine photos show you precise spellbinding methods. Instructions reveal how easily speed hypnotism is accomplished. Become an expert hypnotist. Entertain. Self-hypnosis fully explained. Amazing results. Learn about intriguing newly developed method of mental therapy, mind-power & training while you sleep. Free catalog of new hypnotism books sent on request.

Send for the exciting illustrated book "HYPNOTISM REVEALED" → \$1
12" Phonograph Record Inducing Group-Hypnotism & Self-Hypnosis → \$5

MELVIN POWERS, Master Hypnotist, 1324 Wilshire, Dept. 83 Hollywood 17, Calif

**TAKE THE STEPS NOW THAT WILL GIVE
YOU LIFETIME SECURITY IN AVIATION!**



**NOW
IS THE
TIME**

Booming aviation industry urgently needs properly trained young men! Big paying jobs are open right now, with more to come! Embry-Riddle offers maximum training in minimum time. Fully accredited 8-mo. to 26-mo. courses in all aeronautical phases. Job-fitting instruction backed by 25 yrs. experience training today's aviation leaders. Be prepared.

Enroll now! Illustrated catalog, address:

REGISTRAR, EMBRY-RIDDLE, DEPT. 99, MIAMI 30, FLA.



INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

142-Z VICTOR BUILDING, WASHINGTON 1, D. C.



NOW—BE A FULLY RADIO-TELEVISION 10 MO

**I Send You
18 BIG
KITS**

**OF RADIO-
TELEVISION
EQUIPMENT**

EXTRA MONEY

**Earn While You Learn
In Your Spare Hours!**

You do all your training with me AT HOME in spare hours. Keep right on with your present job and income while learning—and earn extra cash besides! The day you enroll I begin sending you plans and ideas for doing profitable spare time Radio-TV work. Many of my Sprayberry students pay for their entire Radio-TV training this way!

YOU KEEP THIS VALUABLE EQUIPMENT

The many big kits of Radio-Television parts and equipment are sent to my students "for keeps." Nothing need be returned—it is YOURS! There is absolutely nothing else to buy!

TRAINED, QUALIFIED TECHNICIAN IN JUST N T H S OR LESS !

New "Package" Unit Training Plan—PAY AS YOU LEARN—YOU SET THE PACE! TRAIN AT HOME IN SPARE HOURS!—No Monthly Payment Contract to Sign!

Now . . . be ready for Radio-Television's big pay opportunities in a few short MONTHS! Frank L. Sprayberry's completely new "Package" training unit plan prepares you in just 10 MONTHS . . . or even less! Equally important, there is NO monthly payment contract to sign . . . thus NO RISK to you! This is America's finest, more complete, practical training—gets you ready to handle any practical job in the booming Radio-Television industry. In just 10 months you may start your own profitable Radio-Television shop . . . or accept a good paying job in this fascinating expanding field in work you've always wanted to do. Mr. Sprayberry has trained hundreds of successful Radio-Television technicians—and stands ready to train you in less than one year, even if you have no previous experience. You learn by DOING . . . actually working with your hands with equipment of special design to illustrate basic theory instead of relying on books alone. Your training is very interesting because it's really practical.

The Sprayberry 10 MONTH TRAINING PLAN includes, Radio, Television, FM (Frequency Modulation), Public Address Systems . . . everything you need to make big money in this fast moving industry. This new Sprayberry "package" plan includes many kits of genuine, professional Radio-Television equipment. While training at home in spare hours you actually perform over 300 demonstrations, experiments and construction projects. In addition, you build a powerful 6-tube standard and short wave radio set, a multi-range test meter, a signal generator, signal tracer and many other projects. All equipment is yours to keep . . . you have practically everything you need to set up your own service shop. The interesting book-bound lessons, manuals, bulletins . . . all are yours to keep. If you expect to be in the armed forces later, there is no better preparation than good Radio-Television training. These are sound, logical, money-in-the-bank reasons why this training is the best training of all for you.

MEET A FEW OF MY GRADUATES



Training Leads to Good Radio Job

"Got a job in local radio shop soon after enrolling. Very satisfied with training."
— Stanley Clemmons, Kansas.



Radio Profits Pay Cost of Training

"I have more than taken in the cost of your training doing spare time radio repair work. See bright future ahead."
— Thomas Shearer, N. Y.



Earns Easy Spare Time Cash

"While training I made about \$180.00 in spare time. Thank you for wonderful Radio-TV training."
— Herbert Burroughs, W. Virginia.

No Previous Experience Needed to Succeed

My Training in Radio-Television is so complete, so down-to-earth that previous experience is not necessary. I start you with basic fundamentals and carry you in easy, practical steps through one Radio-Television subject after another. You will be amazed at your rapid progress and your knowledge of Radio-Television. Best of all, you put this knowledge to work making spare time cash soon after you enroll! You may train as fast or as slowly as suits your convenience. Each of my students receives individual training!

IF YOU ARE EXPERIENCED IN RADIO

Men already in Radio who seek a short intensive 100% TELEVISION Training with FULL EQUIPMENT INCLUDED are invited to check and mail the coupon at the right.

Sprayberry Academy of Radio, Dept. 55-C
111 North Canal St., Chicago 6, Ill.

Be Ready for Top Paying Radio-Television Jobs!

Radio-Television is growing with amazing speed. More than 2000 broadcasting stations PLUS an additional 102 Television stations are now on the air. Radio sets and TV receivers are being made and sold in record breaking numbers. If you enjoy working with your hands . . . if you like interesting and varied work . . . YOU BELONG IN RADIO-TELEVISION. But you MUST have good Training to "cash in" . . . the training that starts with basic fundamentals and carries through every circuit and problem of Radio-TV.

FREE 3 Big Radio and Television Books



I want you to have ALL the facts about my complete system of Radio-Television Training! Act now! Rush the coupon for my three big Radio-Television books: "How To Make Money In Radio-Television," PLUS my new illustrated Television bulletin PLUS an actual sample Sprayberry Lesson—all FREE with my compliments. No obligation and no salesman will call on you. Send the coupon in an envelope or paste on back of post card. I will rush all three books at once!

Mail Coupon Today!

NO OBLIGATION
No Salesman
Will Call

SPRAYBERRY ACADEMY OF RADIO, Dept. 55-C
111 North Canal St., Chicago 6, Ill.

Please rush to me all information on your Radio-Television Training plan. I understand this does not obligate me and that no salesman will call upon me.

Name..... Age.....

Address.....

City..... State.....

Please Check Below About Your Experience

☐ Are You Experienced?

☐ No Experience

Oil alone won't lubricate your engine

Oil does not cling to metal. It starts to drain into the crankcase the instant you stop your engine and, after long stops, engine parts are dry. When you start, the oil pump carries oil back to moving parts. But it may take up to five minutes before oil reaches all vital parts. Meantime, your engine runs without lubrication. This DRY STARTING causes "Metal Ulcers" . . . accounts for most engine wear.

Save wear and repair—use Miracle Power regularly in your gas and oil. It protects engine surfaces with a clinging film of colloidal synthetic graphite . . . lubricates until oil takes over. Save gas and oil too—because lubricated parts move with less effort. Next time you get gas, get Miracle Power.

Miracle Power Division
THE AP PARTS CORPORATION • TOLEDO, OHIO
Manufacturers of: AP Mileage Getting Mufflers
and Other AP Quality Products



Miracle Power

in gas and oil every
1000 miles—75c per can

If your dealer is out of Miracle Power,
send \$1.50 for 2 trial containers.
Prove its value in your car.

THE AP PARTS CORPORATION
1171 AP Building, Toledo 1, Ohio

I want to prove the benefits of Miracle Power myself.
Enclosed is ☐ check ☐ money order for \$1.50 Please
send me 2 trial containers of Miracle Power.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

MY DEALER'S NAME _____

MY DEALER'S ADDRESS _____

Amazing Invention Defrosts Refrigerators AUTOMATICALLY



Pays Salesmen Up To
\$210.00 a Week!

No wonder our salesmen are getting so rich and happy, with 29,000,000 eager prospects for the sensational Patented D-Frost-O-Matic that defrosts refrigerators Every Night without much fuss or bother. Saves electricity, wear on refrigerator, food and work. You, too, should make up to \$210.00 a week on our FREE TRIAL plan that clinches up to 4 orders out of 5, paying you up to \$7.00 each.

Start Spare Time

Yes, just a few hours in an evening should pay you up to \$18.00 PROFIT! Just plug in D-Frost-O-Matic—women won't let you take it out.

Profits Guaranteed. You take no risk. Getting a flying start in this business will not cost you one red cent, unless YOU agree that it is the most fascinating, best-paying proposition you ever heard of! Rush name and address on postcard TO-DAY for generous FREE TRIAL plan.



END THIS FOREVER

D-FROST-O-MATIC

Dept. B-14, 6 N. Michigan, Chicago

CARBURETOR TOO RICH MAKES MOTORIST TOO POOR



Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits!

Send name, address on penny postcard for free particulars and how to get yours for introducing.

VACU-MATIC CO., 7617-1815 W. State St., WAUWATOSA, WIS.

SHORTHAND IN

Famous Speedwriting Shorthand system. No signs; no symbols; no machines. Uses ABC's. Easy to learn, write, transcribe. Low cost. 100,000 taught by mail. Also typing. 28th year. Write for FREE booklet to

Speedwriting
Dept. 2611-1
55 W. 42nd Street, N. Y. 18

6
WEEKS
AT HOME

FOOT RELIEF

Cuboid

Stabilizers



From America's greatest foot clinic through the vast experience gained in more than a million foot treatments. Director, Dr. John M. Hiss, M.D. has designed the Cuboid Stabilizer, a new foot aid for painful feet. Light, flexible, use in any shoe, interchangeable. Only \$3.95. Money back if not wholly satisfied.

MAIL COUPON NOW with \$3.95 to Stabilizer Co.
740 So. Flower St., Los Angeles 17, Dept. C

Name _____

Street or RFD. _____

City _____ State _____

Shoe Size _____ Width _____ ☐ Woman ☐ Man

**NOW... GET EVERYTHING YOU
NEED TO LEARN AND MASTER**

TELEVISION

**RADIO-ELECTRONICS
...AT HOME!**

**Use REAL commercial-type equip-
ment to get practical experience.**

Your future deserves and needs every advantage you can give it! That's why you owe it to yourself to find out about one of the most COMPLETE, practical and effective ways now available to prepare AT HOME for America's billion dollar opportunity field of TELEVISION-RADIO-ELECTRONICS. See how you may get and keep the same type of basic training equipment used in one of the nation's finest training laboratories... how you may get real STARTING HELP toward a good job or your own business in Television-Radio-Electronics. Mail the coupon today for complete facts — including 89 ways to earn money in this thrilling, newer field.

**Here's the
REAL THING!**

**SET UP YOUR OWN
HOME LABORATORY**

Oscilloscope

R-F Signal
Generator



6-Tube
Radio



Multimeter



**HOME
MOVIES**

ABOVE: Build and keep a real 16 INCH commercial TV receiver. Optional after completing regular training at moderate added cost.

D.T.I., ALONE, INCLUDES BOTH MOVIES and HOME LABORATORY In addition to easy-to-read lessons, you get the use of HOME MOVIES — an outstanding training advantage — plus 16 big shipments of Electronic parts. Perform over 300 fascinating experiments for practical experience. Build and keep real commercial-type test equipment shown at left.

MODERN LABORATORIES

If you prefer, get all your preparation in our new Chicago Training Laboratories—one of the finest of its kind. Ample instructors, modern equipment. Write for details!

MILITARY SERVICE!

If you're subject to military service, the information we have for you should prove very helpful. Mail coupon today.

**Get BOTH of these
information packed
publications FREE!**



ACT NOW! MAIL COUPON TODAY!

DeFOREST'S TRAINING, INC., Dept. PS-11-H
2533 N. Ashland Ave., Chicago 14, Ill.

Without obligation, I would like your late News-Bulletin showing 89 ways to earn money in Television-Radio-Electronics... and how I may prepare to get started in this thrilling field.

Name..... Age.....
Street..... Apt.....
City..... Zone..... State.....

De FOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS
A De VRY INSTITUTION

SELF-CONTROL STARTS HERE



and to restore CAR PERFORMANCE OIL-CONTROL STARTS HERE

To stop oil-pumping, replace worn engine
connecting rod bearings

In your car engine—as in your work—control is all-important for best performance!

When connecting rod and main bearings are worn, they lose control of oil flow. They no longer "meter" exact amounts of oil for proper engine lubrication. Excess oil reaches combustion chambers, burns to performance-stealing carbon on spark plugs, valves, pistons and rings. *Performance goes up in smoke!*

Give new piston rings a chance to do their own job—replace worn engine bearings, too! Genuine Federal-Mogul bearings are engineered for the job of oil-control. They restore smooth performance and economical operation. *Ask your mechanic!*



FEDERAL-MOGUL SERVICE

(Division of Federal-Mogul Corporation)

DETROIT 13, MICHIGAN

CONTROL OIL-PUMPING

WHERE IT STARTS—REPLACE WITH

FEDERAL-MOGUL



BEARINGS

Safety after Sunset REFLECTOR DANGER STRIKES AT NIGHT! DON'T TAKE CHANCES!



At Last

"Safety Insurance"

For motorists, bicyclists, pedestrians and sportsmen. Easily attached to any object or clothing. Attach to visor, pull down when Headlights are out. Reflects brilliantly. Lasts for years. Address and photo can be inserted in Plastic Case.

Promote Safety with Children.

Only **\$.50 EA.**

Postage paid in U.S.A., Canada

AUTOMOTIVE SAFETY DEVICE CO. 444 ASYLUM ST.
HARTFORD 3, CONN.

WHAM-O SPORTSMAN *

\$1.25
45-LB.
PULL!

HITS LIKE A .22 RIFLE—
KILLS RABBITS, SQUIRRELS.
Powerful, silent, accurate.
For hunting, target,
routing pests.
Sportsman's choice
sold world
over!

HUNTING SLINGSHOT

Heavy duty 7" ash stock.
40 steel balls, extra rubber, target.
GUARANTEED—at dealers, or send \$1.25 to
Wham-O Mfg. Co., Box 88, South Pasadena, Calif.
* Professional model of Nat'l Slingshot Assn.
Extra steel ball ammunition, 75c for 200

BECOME AN EXPERT IN TRAFFIC

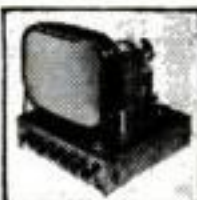
Traffic men earn \$4,000 to \$10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroughly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Placement counsel and help. Write for free 48-page book "Traffic Management—the Fast Growing Profession."

LASALLE Extension University, 417 So. Dearborn St.
A Correspondence Institution, Dept. 11183T, Chicago 5, Ill.

START A SHOP IN YOUR BASEMENT

TELEVISION

EASY TO LEARN AT HOME IN MONTHS



AUTOMOTIVE
MECHANICS
BODY & FENDER
REBUILDING
DIESEL
MECHANICS
TELEVISION
RADIO
REFRIGERATION
MECHANICAL
DRAFTING
BUILDING
CONSTRUCTION
UPHOLSTERING
FOREMANSHIP
FACTORY
MANAGEMENT
HIGH SCHOOL

You Build a 16-in. Set—Get 20 Kits

You also build test instruments; get manuals on new ideas for 5 years; receive 2 weeks of shop training! *All parts sent.* Many TV technicians earn \$100 a week (and more)—10,000 needed now! Note other C.T.I. opportunities at left. Mail coupon for free details. State course.

COMMERCIAL TRADES INSTITUTE

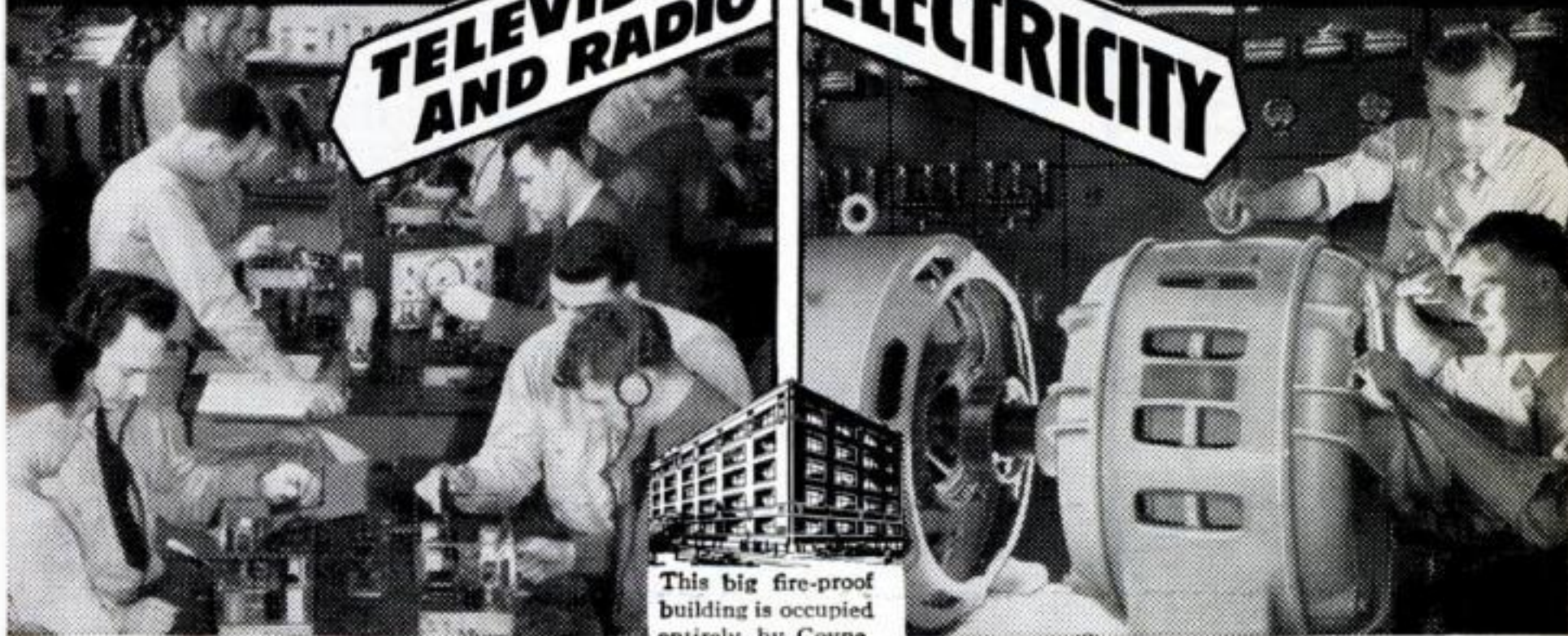
1400 Greenleaf, Chicago 26 • Dept. E1-11

Name _____ Course _____

City _____ State _____

Prepare in our
Big Training
Shops for these

GREAT OPPORTUNITY FIELDS!



This big fire-proof building is occupied entirely by Coyne.

TRAINED YOUNG AND OLDER MEN—VITALLY NEEDED IN NATION'S GIANT DEFENSE PROGRAM

Where do you fit in today's gigantic Defense Program and Industrial expansion? Trained young and older men will play an important part in vital fields. Electricity and Television-Radio are essential to our Defense Program in both Industry and Armed Forces. Don't wait to be assigned to a dull, low pay, no future job. Get training and be ready to pick one of many job opportunities or get a better rating if drafted. Today it's not how young or how old you are that counts, but how prepared you are for jobs that demand skilled men. So, whether you are 16 or up to 50 you are needed. Qualify now for:

1. BETTER RATING, HIGHER PAY IF DRAFTED.
2. A VITAL JOB IN INDUSTRY, IF NOT IN DRAFT.

NOT "HOME-STUDY" COURSES

Our famous Television-Radio Practical-Technical method gives you practical experience on a massive outlay of equipment. Not by correspondence, but actual shop work plus necessary technical training. You are trained right here in the great Coyne shops that have been training men and young men for over 50 years.

TELEVISION-RADIO ELECTRICITY

A great opportunity field and vital to Defense. Here at COYNE you're trained for Construction, Testing, Trouble-Shooting on Radio, Public Address, Sound Units. Training includes FM, Television Installations, Servicing, etc. Many Coyne trained men in good jobs or own well paying Television-Radio businesses of their own.

INCLUDING INDUSTRIAL ELECTRONICS

The Power behind the entire Defense Program. Big future in Power Plant Work, Motors, Armature Winding, Home and Factory Wiring, Appliances, Refrigeration, Maintenance, Illumination, etc. Lifetime job service to Coyne graduates. Send for BIG FREE BOOK.



START NOW—PAY LATER

Don't let lack of money hold you back. You can finance most of your tuition and pay for it later, in easy monthly payments. Special plan for men of draft age. We'll help you get part time work, if you need it, to help pay living costs while at Coyne.

G. I. APPROVED

B. W. COOKE, President

COYNE

ELECTRICAL AND TELEVISION-RADIO SCHOOL

An Institution not for Profit

500 So. Paulina St., Dept. 81-73H, Chicago 12, ILL.

LARGEST, OLDEST, BEST EQUIPPED SCHOOL OF ITS KIND IN THE U.S.

Mail Coupon for Big FREE Book!



Whether you prefer Television-Radio or Electricity, train on actual equipment at Coyne. We will send you a Big, fully Illustrated Book. Indicate below, which course interests you most. No salesman will call. Mail coupon TODAY.

B. W. Cooke, President
COYNE ELECTRICAL AND TELEVISION-
RADIO SCHOOL, 500 S. Paulina St.
Dept. 81-73H, Chicago 12, Ill.

Send me your Big Free book, and details of your special plan for men of draft age. I am interested in field checked below. This does not obligate me.

☐ TELEVISION-RADIO ☐ ELECTRICITY

NAME.....

ADDRESS.....

CITY.....STATE.....

WHAT A PITY more people don't
know about this wonderful
**EASY WAY TO
LEARN MUSIC!**

"I never dreamed I would
ever be able to play—I
didn't know a single note
when I started!"



That's what many of our
850,000 home students
said. So don't think that
learning YOUR favorite
instrument requires "talent"
and long hours of practicing exercises. *That's not true
any more—and it's a pity more people don't realize it!*

NOW you can learn to play piano, guitar, accordion,
or ANY instrument you like—quickly, easily. Even if

**HOW FAMOUS ORCHESTRA
LEADER GOT HIS START**



"I got my
start in music
with a U. S.
School Course.
How easy it is
to learn to
read notes and
play an in-
strument this
'teach your-
self way! In
fact, this school did so
much for me that I've en-
rolled my two daughters."
—Lawrence Welk, famous
orchestra leader.

AMAZES HER FRIENDS

"I bet some friends that
I could learn to play the
piano quickly. They didn't
believe me—because I am
slow learning. Imagine
their surprise last night
when I played
for them. One
said, 'Why,
Louise, it
sounds like
you've been
playing for
years.'
—Louise Gomez,
Oakland, Calif."



you don't know a single note
of music now, you'll start play-
ing real pieces **RIGHT AWAY**
—from the very first lesson!
Properly—by note. Soon you'll
amaze your friends by playing
delightful favorites they love.

**THOUSANDS NOW PLAY
Who Never Dreamed They Could!**

You don't need talent. Every-
thing is made so crystal-clear
that even a child can under-
stand! You learn at home, in
spare time, without a teacher.
And you pay only a few cents
per lesson, including all sheet
music. So why deprive yourself
of the wonderful lifetime joys
of playing music? Thousands
now play who never dreamed
they could!



**FREE BOOK and FREE
Instruction-Sample**

See for yourself why this method is so
quick, easy. Mail coupon now for **FREE**
Illustrated Book and **FREE** Instruction-
Sample. No obligation. No salesman will
call. U. S. School of Music, Studio
A1511, Port Washington, N. Y. (Reduced
prices on instruments to students).

**U. S. SCHOOL OF MUSIC, Studio A1511,
Port Washington, N. Y.**

Please send me **FREE** Book and Instruction-Sample.
No salesman will call upon me. I'm interested in playing
(name instrument)

☐ I do ☐ I do not—have instrument now.

Name.....
(Please Print)

Address.....

City..... Zone
No..... State.....

INVENTORS

Before you make any effort to
market your invention, you should
take the first steps toward proceeding
for patent protection.

I shall be pleased to furnish you
with information relative to patent pro-
cedure upon request from you, and
this will be without any obligation on
your part.

PATRICK D. BEAVERS
Registered Patent Attorney

937 Columbian Building, Washington 1, D. C.

INVENTORS

Send today for "Patent Protection for Inventors" outlin-
ing preliminary steps to take toward patent protection,
also convenient "Evidence of Invention" Form.

VICTOR J. EVANS & CO.
640-M Merlin Building • Washington 6, D. C.

PATENTS PATENT LAWYER

GUSTAVE MILLER
REGISTERED PATENT ATTORNEY
PS-III WARNER BUILDING
WASHINGTON 4, D. C.

ASSOCIATE EXAMINER
U. S. PATENT OFFICE 1922-1929
PATENT ATTORNEY & ADVISOR
U. S. NAVY DEPT. 1930-1947
Send for **PATENT INFORMATION**
Book and "INVENTOR'S RECORD"
without obligation.

INVENTORS

Whether an invention is patentable can be substantially de-
termined by a search of the U. S. Patent records. Without
obligation, write for information explaining the steps you
should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.



PATENTS

C. A. SNOW & CO.

REGISTERED PATENT ATTORNEYS

WRITE FOR INFORMATION TO

426 SNOW BUILDING, WASHINGTON 1, D. C.



INVENTORS

IF YOU WISH TO PROTECT YOUR INVEN-
TION, You should take steps to protect it
by a U. S. Patent. Write me for
"INVENTION RECORD" FORM

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 111C
NEW YORK CITY



How can you serve your country best?

You may serve in uniform. You may serve on the production front. But this much is sure . . . you will serve your country best if you are *trained*.

America needs *trained* men. Aircraft and engine mechanics, boilermakers, carpenters, instrument repairmen, machinists, metal workers, patternmakers, welders and other *trained* craftsmen. Men

with the *training* to fill these and other skilled jobs are *scarce*.

Do you have the ambition and initiative necessary to get the training that will help you serve your country best? If you have, you can learn at home in your spare time from the International Correspondence Schools. The coupon will start you on your way.

INTERNATIONAL CORRESPONDENCE SCHOOLS

BOX 7692-M, SCRANTON 9, PENNA.

60

th Anniversary

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses

- ☐ Air Conditioning ☐ Heating
☐ Plumbing ☐ Refrigeration
☐ Refrigeration, Domestic
☐ Refrigeration & Air Conditioning
☐ Steam Fitting

Aeronautics Courses

- ☐ Aeronautical Engineer's, Jr.
☐ Aircraft Drafting & Design
☐ Aircraft Mechanic
☐ Engine Mechanic

Automotive Courses

- ☐ Automobile ☐ Auto Technician
☐ Auto Electric Technician
☐ Auto Body Rebuilding & Refinishing

Chemical Courses

- ☐ Chemical Engineering
☐ Chemistry, Analytical
☐ Chemistry, Industrial
☐ Food-Plant Sanitation
☐ Petroleum Refining ☐ Plastics
☐ Pulp and Paper Making

Civil Engineering and Architectural Courses

- ☐ Architecture ☐ Architectural Drafting
☐ Bridge and Building Foreman

- ☐ Building Estimating
☐ Civil Engineering
☐ Contracting and Building
☐ Highway Engineering
☐ Reading Structural Blueprints
☐ Sanitary Engineering
☐ Structural Drafting
☐ Structural Engineering
☐ Surveying and Mapping

Communications Courses

- ☐ Electronics
☐ Practical Telephony
☐ Radio, General ☐ Radio Operating
☐ Radio Servicing ☐ Television
☐ Telegraph Engineering

Electrical Courses

- ☐ Electrical Drafting
☐ Electrical Engineering
☐ Electric Light and Power
☐ Lighting Technician
☐ Practical Electrician

Diesel Engines Courses

- ☐ Diesel Engines
☐ Internal Combustion Engines

Mechanical Courses

- ☐ Forging ☐ Foundry Work
☐ Heat Treatment of Metals

- ☐ Industrial Engineering
☐ Industrial Instrumentation
☐ Industrial Metallurgy
☐ Machine Shop
☐ Mechanical Drafting
☐ Mechanical Engineering
☐ Mold-Loft Work
☐ Patternmaking—Wood, Metal
☐ Reading Shop Blueprints
☐ Sheet-Metal Drafting
☐ Sheet-Metal Worker
☐ Ship Drafting ☐ Ship Fitting
☐ Tool Designing ☐ Toolmaking
☐ Welding—Gas and Electric

Railroad Courses

- ☐ Air Brake ☐ Car Inspector
☐ Diesel Locomotive
☐ Locomotive Engineer
☐ Locomotive Fireman
☐ Locomotive Machinist
☐ Railroad Section Foreman
☐ Steam-Diesel Locomotive Eng.

Stationary Engineering Courses

- ☐ Power Plant Engineering
☐ Stationary Fireman
☐ Stationary Steam Engineering

Textile Courses

- ☐ Cotton Manufacturing ☐ Rayon Mfg.
☐ Loom Fixing
☐ Textile Engineering
☐ Woolen Manufacturing

Business and Academic Courses

- ☐ Accounting ☐ Advertising
☐ Bookkeeping
☐ Business Administration
☐ Business Correspondence
☐ Business Law ☐ Cartooning
☐ Certified Public Accounting
☐ Commercial ☐ Commercial Art
☐ Cost Accounting
☐ Fashion & Book Illustration
☐ Federal Tax ☐ First Year College
☐ Foremanship
☐ Good English ☐ High School
☐ Higher Mathematics
☐ Industrial Supervision
☐ Motor Traffic
☐ Personnel—Labor Relations
☐ Postal Civil Service ☐ Retailing
☐ Retail Business Management
☐ Salesmanship ☐ Secretarial
☐ Sign Lettering ☐ Stenography
☐ Traffic Management

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Special tuition rates to members of the Armed Forces. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

VOTE TODAY

FOR THE FUTURE YOU WANT!

AMERICAN SCHOOL, Dept. G846, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

- | | | |
|--|---|---|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Drafting—Building Trades | <input type="checkbox"/> Plastics Engineering |
| <input type="checkbox"/> Air Conditioning | <input type="checkbox"/> Drafting—Machine Trades | <input type="checkbox"/> Plumbing—Practical |
| <input type="checkbox"/> Architecture & Building | <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Automotive Technician | <input type="checkbox"/> Electricity—Practical | <input type="checkbox"/> Refrigeration |
| <input type="checkbox"/> Better Foremanship | <input type="checkbox"/> Electronics—Industrial | <input type="checkbox"/> Retail Merchandising |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> High School Courses | <input type="checkbox"/> S. Ismanship—Outside |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Machine Shop Operations | <input type="checkbox"/> Sheet Metal Work |
| <input type="checkbox"/> Contracting | <input type="checkbox"/> Mathematics & Slide Rule | <input type="checkbox"/> Tool Making |
| <input type="checkbox"/> Diesel Technician | <input type="checkbox"/> Mechanical Engineering | |

NAME..... OCCUPATION.....
HOME ADDRESS..... AGE.....
CITY..... STATE.....

THIS IS YOUR BALLOT
Find the subject that interests you most and then... Check, Sign and Mail Today

• Today, choose the job you want — and prepare for it in spare time at home. Or if you are already engaged in the work you like best, start training now for quicker promotion. In hours you might otherwise waste, gain the knowledge and skill that can help you to get ahead faster, make more money, and have greater security.

Training Backed by 54 Years of Experience

For over half a century American School has helped ambitious men and women toward success by providing specialized training for commercial and technical advancement. Its study program for you has been planned by experts with years of experience in the subject you select and they will give you needed guidance every step of the way.

Don't Delay Your Start

Give serious thought to the list of training courses listed above. Pick the opportunity that interests you, check it and add your name and address. (Check more than one if you are undecided as to which appeals most.) Finally clip out and mail the "ballot" and full information will be supplied, without cost or obligation.

AMERICAN SCHOOL
DEPT. G846, DREXEL AT 58th, CHICAGO 37, ILL.

**THE SOONER YOU START, THE
SOONER YOUR GOAL CAN BE REACHED**



MEN! send for this MONEY- MAKING OUTFIT

MAKE \$15⁰⁰ IN A UP TO 15 DAY

Do you want to make more money in full or spare time... as much as \$15.00 in a day? Then write for this BIG OUTFIT, sent you FREE, containing more than 150 fine quality fabrics, sensational values in made-to-measure suits and overcoats. Take orders from friends, neighbors, fellow-workers. No experience needed. You'll say it's the greatest way to make money you ever saw.

SAMPLE SUITS TO WEAR Pay No Money! Send No Money!

Our plan makes it easy for you to get your own personal suits and overcoats without paying 1c, in addition to your big cash earnings. This offer is limited. Rush your name and address for big FREE OUTFIT—today!

W. Z. GIBSON, INC., Dept. Z-520
500 S. THROOP ST., CHICAGO 7, ILL.



MARVEL

Mystery Oil

- Frees Sticky Valves
- Stops Hydraulic Valve Clatter

Buy it at your favorite gas station



PHOTOGRAPHY

EARN BIG MONEY! PERSONAL ATTENDANCE TRAINING in News-Magazine-Fashion-Portrait-Advertising-Natural Color Photography. Splendid equipment, glamorous models. Or—our COMPLETE HOME STUDY COURSE provides you with a spare time short-cut to success.

Our 42nd year. Write immediately for BIG FREE BOOK!

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 5, 10 West 33 St., New York 1, N. Y.

BUILD a "Schneider" RACER

Have Fun! Save 1/2 the Cost!



Complete plans with FULL SIZE details for America's finest designed and engineered outboard racers, sailing dinks, rowboats and skiffs... ALSO... easily assembled cut-to-fit KITS.

SEND 15c for illustrated literature

SCHNEIDER BOAT CO. Dept. S-11, 1916 W. VLIET ST.
MILWAUKEE 5, WIS.

MAIL ORDERS • FREE DELIVERY

UNCONDITIONAL MONEY BACK GUARANTEE

Send for FREE WAR SURPLUS CATALOG

Sale! New Imported BINOCULARS

Largest Binoculars Dealers in the West! Our Prices INCLUDE ALL TAXES!

1st Quality precision, prismatic color-corrected Binoculars at prices the average man can afford. Imported directly by us; compare with Binoculars selling for 3 and 4 times more. Unconditional Money Back Guarantee

ALL our Binoculars have COATED ACHROMATIC LENSES



6 x 30	7 x 35	8 x 30	7 x 50
\$2750	\$3295	\$2850	\$3395

8 x 30 Center Focus \$3995	6 x 15 Theatre and Sport Glass. Pocket size-powerful. With Leather Case and Straps. \$1695
----------------------------------	--

Handsome Deluxe ALL LEATHER BINOCULAR CASES

Finest all leather, plush lined saddle stitched case with safety clasp lock.	For 6x30, 7x35, 8x30	\$395	For 7x50, 10x50, 9x40	\$495
---	----------------------	-------	-----------------------	-------

UNIVERSAL ENTERPRISES — 946 S. MAIN, LOS ANGELES 15, CALIF.



"We have been using your book on Auto Repair for the past year and feel like it is a third man around the shop."—F. M. Scott, Stanwood, Wash.



"Fixed motor in 30 minutes another mechanic had worked on half a day."—C. Auberry, Murfreesboro, Tenn.



"Instructions so clear, have no trouble learning anything about any car. Now working as mechanic in big plant."—S. Ordenez, San Francisco, Calif.



"So easy to understand—have done jobs with Manual I would not have attempted without it."—C. L. Vanerstrom, Hazel Park, Mich.



"I have found my MoToR Manual a wonderful help. It has put me in a position to do every job."—S. L. Sharpless, Los Angeles, Cal.

THOUSANDS OF MEN ARE RAVING ABOUT THIS GIANT GUIDE!

Now YOU Can Be a "Cracker-jack" at Auto Repairs!

Thousands of Easy-to-Follow Step-by-Step Pictures

Easy-Step-by-Step Instructions Show How to do ANY Job on ANY Car—from 1935 through 1951!

BRAND-NEW 1951 EDITION!

COVERS 800 MODELS—ALL THESE MAKES!

Buick
Cadillac
Chevrolet
Chrysler
Crosley
De Soto
Dodge
Ford
Frazer
Henry J.
Hudson
Kaiser
Lafayette
La Salle
Lincoln
Mercury
Nash
Nash Rambler
Oldsmobile
Packard
Plymouth
Pontiac
Studebaker
Terraplane
Willis

ALSO complete tune-up adjustments for: American Bantam, Auburn, Austin, Cord, Graham, Hupmobile, Pierce Arrow, Reo.

USED BY U.S. ARMED FORCES

THOUSANDS of men are raving about MoToR's BIG NEW 1951 ILLUSTRATED AUTO REPAIR MANUAL! It enables them to do any job FASTER and better; do MORE jobs; make MORE money!

Whether it's on a 16-year-old "jalopy" or a brand-new 1951 beauty, YOU, too, can "breeze through" any repair job quickly, easily, right! Just look up the make, model, and job in the quick index—and go to it!

Everything You Need to Know to Repair Any Car!

This NEW 1951 REVISED edition has MORE REPAIR INFORMATION THAN EVER—right up to the minute! 771 big pages, 2300 "This-Is-How" pictures—clear drawings, diagrams, cut-away photos that lead you every step of the way. Over 200 "Quick-Check" charts containing more than 38,000 essential repair specifications. Over 225,000 service and repair facts. Clear, simple directions. You can't go wrong!

Any man—even a green beginner—can do a good job. If you're a top-notch mechanic, you'll find yourself tackling jobs now that you wouldn't touch before!

Earn More Money! Win Greater Prestige!

The editors of MoToR's Manual have put together the "Know-How" from over 150 Official Factory Shop Manuals; "boiled it down" into one handy book!

Includes ALL Automatic Transmissions and Semi-Automatic Transmissions. Covers the new GM Rochester Carburetor, Engines... Chokes... Carburetors... Fuel Pumps... Hydramatic Drives... Overdrives... Oil Filters... Starting Motors... Generators... Distributors... Clutches... Universals... Axles... Brakes... Steering Gears... Shock Absorbers, etc.

Valuable help in Body Service. Factory Specifications and Adjustment Tables. Tune-up Charts. Tables of Measurements and Clearances. Overhauling and Replacement Facts—AND MUCH, MUCH MORE.

Used by Armed Forces, hundreds of thousands of auto service men! YOU'LL want it, too, once you see its 771 giant pages—almost a foot high!—its 2300 close-up pictures! Try it on the following UNCONDITIONAL GUARANTEE:

Try Book for a Week FREE

Send No Money. Pay nothing to postman. Test book in your own garage or shop. It's GUARANTEED to pay for itself in 7 days. If it doesn't, just return the book, and owe nothing. You don't risk a penny. Rush coupon for your free-trial copy of this great money-saving Manual. MoToR Book Dept., Desk 211, 250 West 55th St., New York 19, N. Y.

SEND NO MONEY! TRY BOOK FOR A WEEK FREE!

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR Book Dept., Desk 211, 250 West 55th Street, New York 19, N. Y.

Rush to me at once: (Check box opposite book you want)

☐ MoToR's New 1951 AUTO REPAIR MANUAL. If O.K. I will remit \$1 in 7 days (plus 35c delivery charge), then \$2 monthly for 2 months, and a final payment of 95c a month later. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$8 cash with order.)

☐ MoToR's New TRUCK AND TRACTOR REPAIR MANUAL. (Described at left.) If O.K. I will remit \$2 in 7 days, and \$2 monthly for 3 months, plus 35c delivery charge with final payment. Otherwise I will return book promptly. (Foreign price, remit \$10 cash with order.)

Print Name Age

Print Address

City & Zone No. State

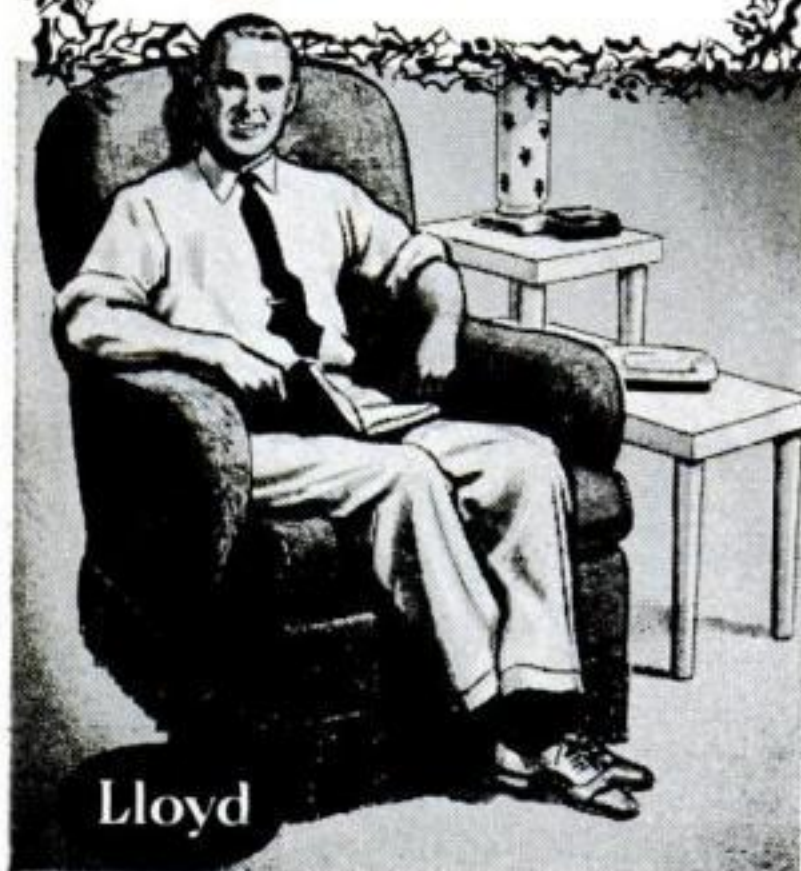
☐ SAVE 35c delivery charges by enclosing WITH COUPON check or money order for full payment of \$5.95 for Auto Repair Manual (or \$8.00 for Truck and Tractor Manual). Same 7-day return-for-refund privilege applies.

Same FREE 7-Day Offer on MoToR's Latest TRUCK and TRACTOR REPAIR MANUAL

Covers EVERY job on EVERY gasoline-powered truck and farm tractor made from 1936 thru 1951! Over 1400 pictures, 925 big 8½ x 11-inch pages, 390,000 facts. Used by Armed Forces. All types Gasoline Engines, Fuel Systems, Starters, Generators, Clutches, Transmissions, Axles, Torque Dividers, Transfer Cases, Brakes, Steering, etc. Check proper box in coupon for free trial.



**It's my dream of
Comfort come True!**



This Christmas, Give Dad a ROCK-A-FELLER CHAIR

If there's a man at the top of your list, give him the priceless gift of unmatched Rock-A-Feller comfort! Its special rocking action gives the deep-down, *restful* relaxation a man loves—and its smart lines rate a place of honor in any living room!

Only Rock-A-Feller Has This Comfort Feature

The Rock-A-Feller comfort feature adjusts to *your* weight and taste. It's patented!



MAIL COUPON TODAY for *free* folder showing the new Rock-A-Feller models and name of your nearest Lloyd dealer.

Lloyd Manufacturing Company, Dept. K-1
Menominee, Michigan

Please send me your new folder, "The Chair Men Call 'Richest in Comfort,'" and the name of my nearest Lloyd dealer.

NAME.....

ADDRESS.....

CITY & ZONE.....

STATE.....

5,000 MORE MILES From FRONT TIRES

**"Educated Nut" Stops
"Scuffing"—FREE TRIAL!**

Long used by truck fleets (200,000 now in use) the "Educated Nut" is now available for all passenger cars. Allows you *perfect* adjustment on front wheel bearings every time. Replaces front wheel bearing nuts now on your car. When you "back-off" your present front wheel bearing nuts to insert cotter pin, you loosen your bearing adjustment enough to cause as much as $\frac{3}{8}$ " wobble on the tread. This causes "scuffing" and "snake tracking", costs you speed, rubber, gas, brakelining and \$\$\$\$\$.

THE EDUCATED NUT

- Adds up to 5,000 miles more tire life
- Stops bearing breakage
- Makes steering easier, safer
- Increases brake efficiency, stops "squeaks" of all brake squeaks

HOW TO INSTALL

Screw threaded piece up to perfect adjustment (turn up tight, then back till "heel revolves free"). Then line up cotter pin holes in cap with hole in spindle. Snap on steel cap, insert cotter pin. You never "back-off" more and destroy adjustment to insert cotter pin as with old nuts.

FREE TRIAL—Send no money. Just send name and address, make and year of car. A complete set of "Educated Nuts" (2 nuts, 2 caps, 2 pins) and instructions will be sent postpaid. Install and try. Feel the difference in driving immediately! Within two weeks, either return the complete set at no obligation or send just.....

\$2.98

Dealer, truck owner, inquiries invited.

POLIZZI PRECISION PRODUCTS COMPANY

Dept.
11-5

5024 Lankershim Blvd., No. Hollywood, Calif.



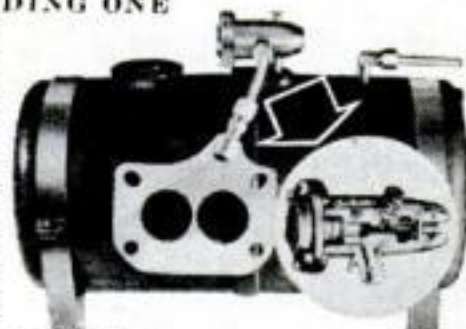
BURN WATER in your CAR

with the **AMAZING OCTA-GANE "50"**

Learn how you can enjoy all the benefits of water-alcohol injection with this all bronze, "fog type", exhaust pressure operated injection unit **WITHOUT SPENDING ONE CENT.** NOW

OR EVER. Our sensational new "cost-free" plan, which requires no selling, helps you get automotive accessories, economy products and "hot rod" equipment absolutely **Free.** Write today for full details and catalog of products offered.

FREE!



NARCO, Dept. OG-11, 350 W. Washington Blvd., Venice, Calif.

REAL ESTATE BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED

CATALOG NOW! No obligation. Graduates report making substantial incomes. Start and run **your own business quickly.** Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in our classrooms in big cities. Diploma awarded. Nationally known. G. I. Approved.

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
Suite 300 Law Bldg., Dept. PS, Kansas City, Mo.

**FREE
BOOK
TELLS
HOW**

Tells How You Can Learn to



**FREE
BOOK**

**MOUNT
BIRDS!**

Learn At Home

Men, Boys, Hunters, Fishermen, mount and save your lovely wild-game trophies. Be a **Taxidermist.** Mount Birds, Animals, Heads, Fish, Tan skins. YOU learn easily, quickly in spare time. Have a grand home-museum. The finest and the greatest hobby known, for sportsmen. Fun, real profits.

FREE BOOK

Yes, **FREE.** Beautiful strange, valuable **Book,** telling all about Taxidermy. Contains over 100 beautiful game-pictures. And it's yours **FREE,** if you rush your request. You can mount all kinds of wild-game, and common specimens too. We can positively **TEACH YOU.** So **GRASP** this opportunity. **RUSH** letter or postal for this amazing **FREE BOOK.** Don't delay. State your **AGE.** **N. W. SCHOOL OF TAXIDERMY,** 2671 Elwood Bldg., Omaha 2, Neb.

GET THIS FREE BOOK!

TRAIN AT HOME IN YOUR SPARE TIME

GET THE MONEY AND SECURITY YOU'VE ALWAYS WANTED!



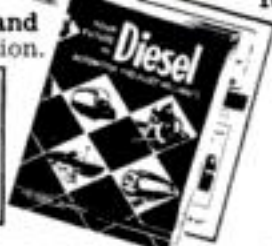
L. J. ROSENKRANZ, President, National Schools, the man who has trained many, many men like YOU. Men who now own successful, respected businesses of their own. Men who hold important, high-paying positions in famous companies. You CAN be a success. Mail coupon for more details.

Let Me Show You How! Mail the Coupon for My FREE Books!

Each book has page after page in color. Gives you the complete story about my proved training method...tells how quickly it can train you for a secure, high-paying job. Don't wait. Get the facts. Send today for my valuable books on Radio-Television or Automotive-Diesel. Check the coupon at right and mail it to me today. Absolutely no obligation.

NO SALESMAN WILL CALL!

I'll send you a **FREE SAMPLE LESSON TOO**, if you act fast! Shows how easy it is to learn with National Schools Home Training.



DON'T PUT IT OFF...MAIL TODAY!

NATIONAL SCHOOLS, Dept. C-111
4000 South Figueroa Street
Los Angeles 37, California

Mail in envelope
or paste on
penny postal card

Send me **Free** the book checked below and the sample lesson. I understand no salesman will call on me.

- ☐ "MY FUTURE IN RADIO-TELEVISION & ELECTRONICS" OR
☐ "MY FUTURE IN DIESEL-AUTOMOTIVE & ALLIED MECHANICS."

NAME _____ AGE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Check here if you were released from the service less than 4 years ago.

Let National Schools—a resident-training school for nearly 50 years—train you at home for today's unlimited opportunities in Radio-TV or Automotive-Diesel. National Schools is one of the largest schools of its kind in the world. It has 4 big buildings of modern shops and labs. Its faculty is considered tops. You learn fast from easy lessons—all perfected under actual shop conditions. Approved for eligible vets.



Earn Extra Money while you're learning! I'll show you how!
EASY TERMS • FREE GRADUATE SERVICE
Mail coupon today—find out more!

WHICH HIGH-PAYING FIELD DO YOU WANT?

TODAY'S SHORTAGE OF TRAINED TECHNICIANS CREATES CHANCE OF A LIFETIME FOR YOU...IN EITHER FIELD!

RADIO-TELEVISION & ELECTRONICS

OR

AUTOMOTIVE-DIESEL AND ALLIED MECHANICS

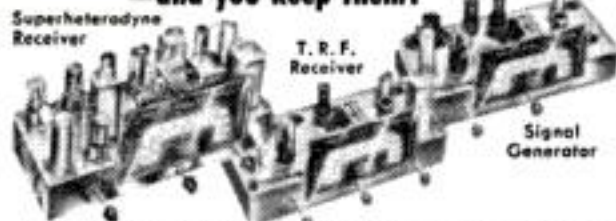
JOB SECURITY! BIG MONEY! FOR YOU IN TODAY'S EXPANDING INDUSTRIES!

Think of it! With guided missiles, radar and other electronic devices so important to national defense. With big, new developments in color TV. With over 90,000,000 home and auto radios, over 12,000,000 TV sets. With more than 3100 radio stations...over 100 TV stations—and more building every day—imagine the terrific opportunity you have!

You Train at Home—In Your Spare Time

With National Schools Master Shop Home Training, you master all phases of Radio-Television-Electronics. You learn fast from hundreds of pictures and diagrams. All lessons have been developed and tested in National Schools famous shops and labs. No wonder your National Schools training is so up-to-date, practical, interesting. And so easy!

LOOK! WE SEND YOU ALL THESE PARTS! —and you keep them!



We send you lots of standard professional parts. You do lots of practical experiments. You learn step by step. Until you can build the big Superheterodyne Receiver you see above—and other important test units. Mail the coupon—today.

I TRAIN YOU FOR GOOD-PAYING JOBS LIKE THESE

Radio Station Engineer; District Service Manager; Aircraft Radio Inspector; Inspector Technician; Own your own repair shop; Service Specialist; Special Civil Service Positions; Sound Truck Operator; Complete Television Service and many others.

Thousands of National Schools graduates have jobs like these. Why not you? Start your career—be sure to mail the coupon today.

Only National Schools Gives You This Professional Multi-Tester



You get this factory-made new Multi-Tester...an important instrument every Radio-TV man must have.

GREATEST DEMAND FOR TRAINED MEN IN HISTORY! NOW IS YOUR CHANCE!

What an opportunity! With over 8 million older cars needing big service and repair jobs. With defense industry having more high-paying jobs than they can fill. With the Armed Forces offering quick advancement to trained mechanics. **YOU ARE NEEDED** as never before! Now you can get the good pay, security, the satisfaction of doing what you want to do! Don't delay—mail the coupon **NOW!**

Right in Your Own Home!

You learn all about Gasoline Engines, Diesel and Special-Fuel Engines, Automotive Tune Up, General Garage Mechanics, Auto Electrical Service. You get complete training for this great, growing industry.

Yet National Schools Home Training is easy! Because it's based on actual shop methods in National Schools big resident school. Mail the coupon for more details—**NOW.**

National Schools Gives You All These Tools

You start out owning the tools of your trade. A kit of standard, professional tools and equipment. They're all part of your course! —And you keep them—they're yours!



I Offer You All These!

Basic Lesson Texts, Diesel Installation & Maintenance Instructions, Spare Time Lessons, Engine Service Manuals, Engine Repair Drive Systems, Diesel Electric Power Texts, Special Thermodynamic Instruction.

Attention: Men Going into the Service Soon!

With National Schools training in Radio-Television or Automotive-Diesel, you have the opportunity to get into special service classifications. That means higher pay and grade, more prestige—right away! This is important—so be sure to mail the coupon today without fail.

WHICH OF THESE HIGH-PAYING JOBS WOULD YOU LIKE?

MOTOR TUNE UP SPECIALIST
DIESEL ENGINE SPECIALIST
FARM EQUIPMENT MECHANIC
YOUR OWN GARAGE OR REPAIR SHOP
GENERAL GARAGE MECHANIC
PARTS DEALER
AUTO ENGINE REBUILDING
FUEL INJECTION SPECIALIST

You can have secure jobs like these. Just mail the coupon—and find out!

NATIONAL SCHOOLS TECHNICAL TRADE TRAINING SINCE 1905
LOS ANGELES 37, CALIFORNIA

FREE

★
**1952
ALLIED
RADIO & TV CATALOG**
EVERYTHING IN RADIO
AND TV AT LOWEST PRICES!

SEND FOR IT

212 PAGES
Value-Packed

**Everything for
Experimenters, Builders, Amateurs,
Servicemen, Engineers, Soundmen...**

Save money on every Radio and TV need! Get the big 212-page 1952 ALLIED Catalog featuring the world's largest selections of top-quality electronic equipment at lowest, money-saving prices. See the latest in TV, home radios, Amateur equipment, P.A. systems and Hi-Fidelity custom sound, recorders, test instruments, builders' kits—plus thousands of parts, tools, books and diagrams. Get more for your money from the World's Largest Radio Supply House. Send today for your **FREE 1952 ALLIED Catalog!**



Save on
Everything
in Radio & TV

**FREE
CATALOG**

SEND FOR IT TODAY

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-L-1
833 W. Jackson Blvd., Chicago 7, Ill.

☐ Rush FREE 1952 ALLIED 212-Page Catalog

Name _____

Address _____

City _____ Zone _____ State _____



I need 500 Men to wear **SAMPLE SUITS!**



Pay No Money—Send No Money

My plan is amazing! Just take a few easy orders for my sensational values in made-to-measure suits. Get your own suits **without a penny cost** and make money too! Men can't resist the outstanding style, long wear and low price of my made-to-measure suits. You need no experience. Spare time pays big profits. Rush name and address today for complete details. **Big Free Sample Outfit** contains more than 100 actual woolen samples, style illustrations, etc. Write now! **PROGRESS TAILORING CO., Dept. 7-220**
500 S. Throop St., Chicago 7, Illinois

300 Power Import **\$14.95** MICROSCOPE

POSTPAID

LABORATORY MODEL—Triple revolving turret holds 100, 200, and 300 power lenses! No frills, just excellent optical qualities, delicate adjustment, solid construction. Its quality and price astounded biology instructors. A lifetime bargain for students, schools, labs, research, amateurs. *Anyone can now own one!* (Performance cannot be duplicated for \$75.00)

FEATURES: Fine micro adjustment, adjustable plano substage mirror. Dovetail hardwood case included free. If you are not amazed at its quality, send it back in 10 days. Your money refunded immediately. Send check, cash or M.O. for **\$14.95 ppd.** Free catalog. Money back guarantee.



AKRON ARMY-NAVY STORES 4400 Sunset Blvd.
Los Angeles 27, Calif. Dept. **11-5**

MONEY for MEN ALL DATA **FREE**

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. 1/2c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.

FEBRUARY

S	M	T	W	T	F	S
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

DRIVE 3 TO 6 DAYS A MONTH
Gas Free!

Amazing discovery, tested in Engineering Dept. of leading U. S. University, reduces gasoline consumption as much as 20%—gives you up to 6 days a month **gas free driving**—may actually **pay for itself** in cash savings. Also better performance, more power, quicker starts, faster acceleration, on all cars, light trucks, tractors—any age, make or model. It can help keep you rolling if emergency gas restrictions come.

**TEST IT 30 DAYS ON YOUR OWN CAR
BEFORE DECIDING**

No one can appreciate the astounding benefits of this new miracle development without actual day-by-day experience on the road—so we want you to **try it for 30 days** on your own car **at our risk**. Write today for complete **FREE** details, technical explanation and 30-Day Examination Request Blank.

G. B. SCHUYLER, Dept. 311
2804 10th St., Berkeley 2, Calif.

**SEND
NO
MONEY**

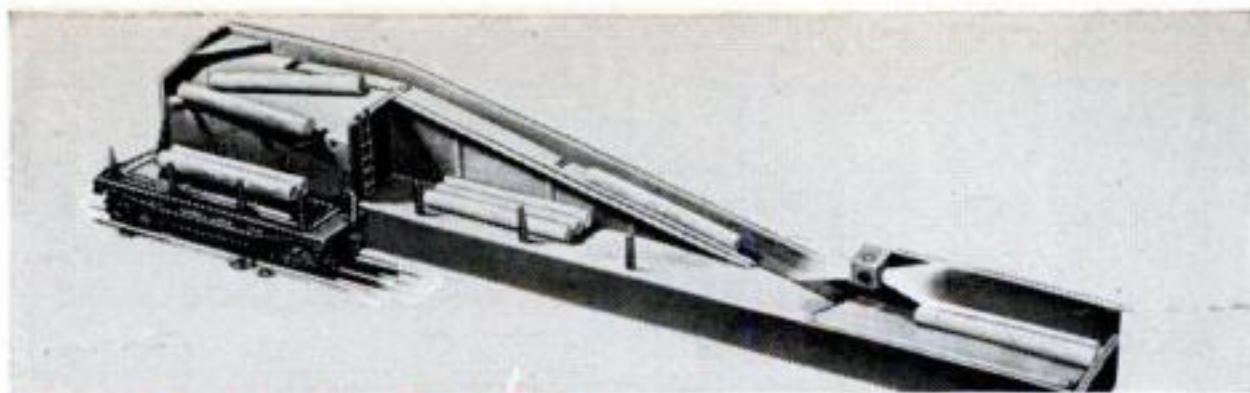
MAIL COUPON NOW!

Gentlemen:
Send me **FREE** examination request blank and complete details on your amazing new device that will give my car more power and pep—better all-around performance. I am under no obligation—everything you send is **FREE** and **POSTPAID**.

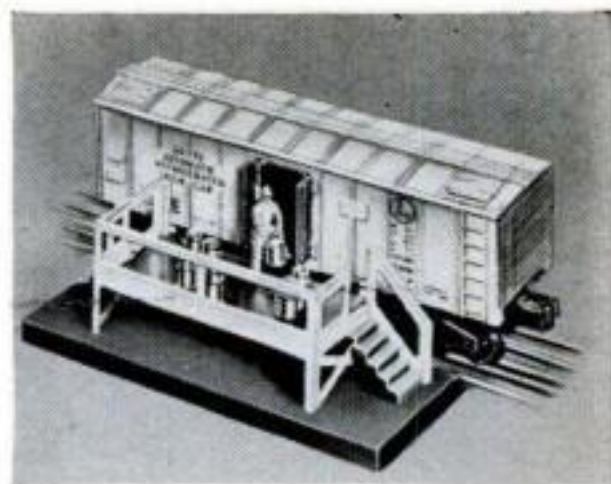
NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

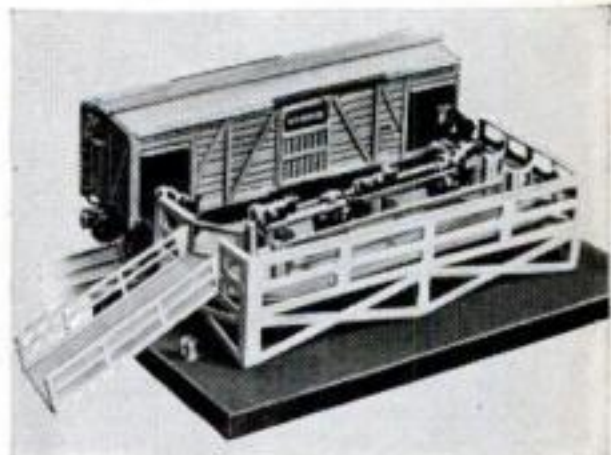
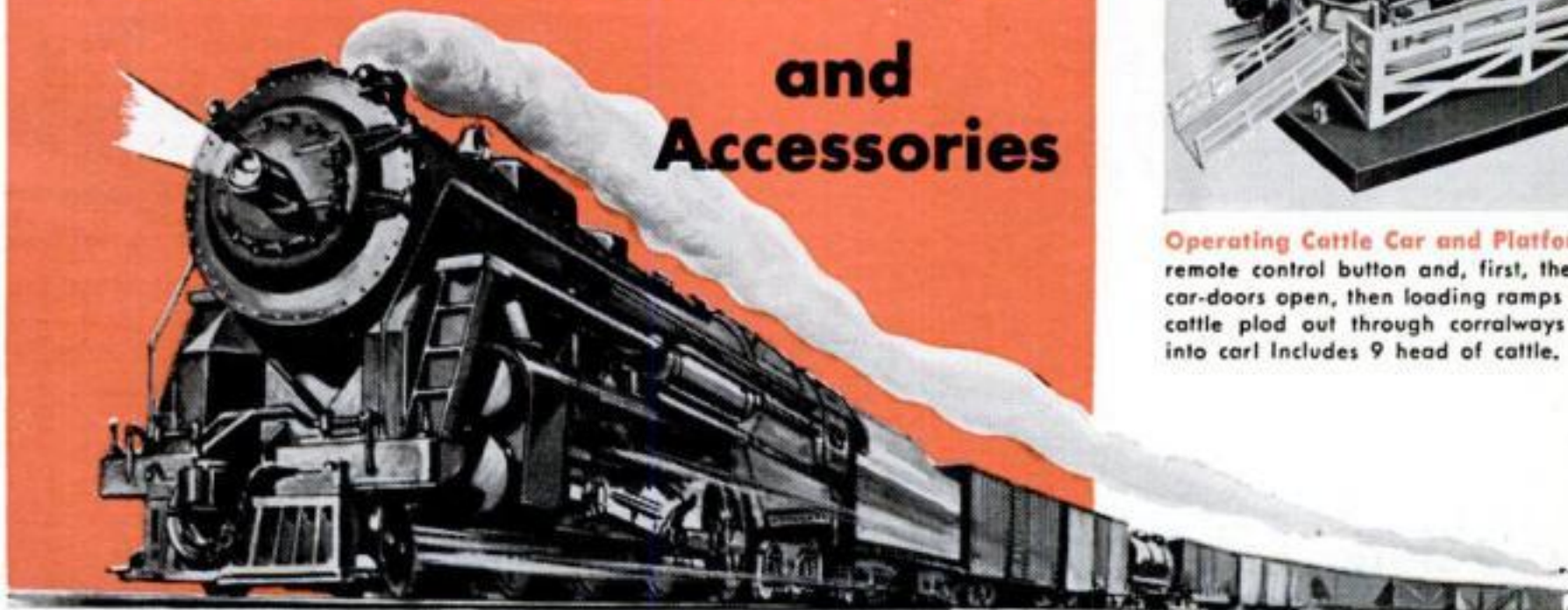


Conveyor Type Operating Lumber Loader — Push remote control button and conveyor belt starts moving, picking up logs one at a time and raising them slowly to upper platform, from which they tumble automatically over tilting stakes into waiting car. No siding needed!

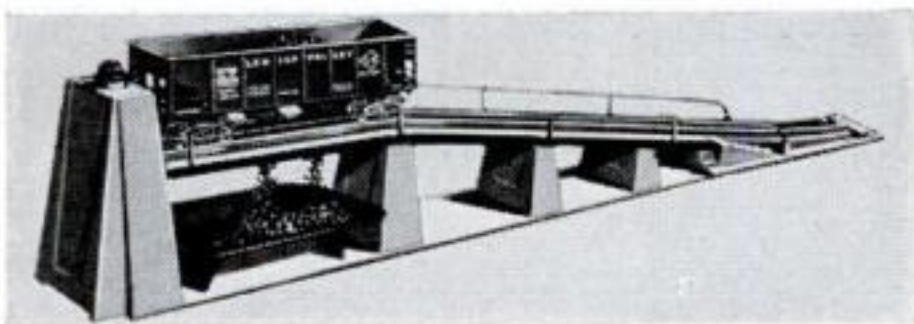


Operating Milk Car and Platform — Press remote control button and doors open, milkman picks up dairy cans one at a time, puts them on platform. (Tiny magnets in bottoms of cans hold them upright!) Pure white car with real "reefer" detail. Stainless steel platform.

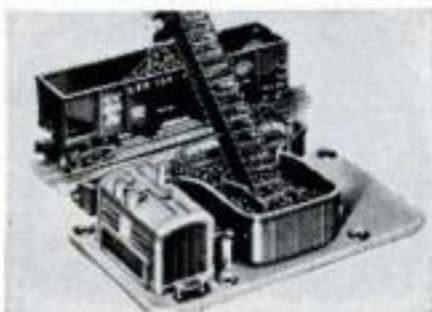
Build a Bigger Railroad... Real as Life with Your **LIONEL TRAINS** and **Accessories**



Operating Cattle Car and Platform — Press remote control button and, first, the overhead car-doors open, then loading ramps drop, then cattle plod out through corralways and back into car! Includes 9 head of cattle.



Operating Coal Ramp and Hopper Car — Three remote control operations after you switch hopper car onto ramp! Press first button and train uncouples from hopper car, to roll away. Press second button and hoppers open, coal unloads into bin. Press third button and hopper car uncouples, to-roll back to lower track. Includes ramp, hopper, coal.



Diesel Type Operating Coal Loader — Remote control switch loads car with artificial coal carried up in conveyor buckets. Operates anywhere on track, no sidings needed.

SPECIAL COUPON OFFER!

See Lionel trains in the catalogue! Hear them in action!...whistles, bells, horns and railroad sound effects on this record.



LIONEL — FOR REALISM

Build a bigger railroad... add realism, action and thrills — make it complete — with varied and realistic LIONEL accessories. Match the real-life performance of your LIONEL TRAINS with dramatic action all along the way... more fun, more excitement every mile. See these sensationally real LIONEL ACCESSORIES in action at your dealer's. Or send for special coupon offer below—New LIONEL catalogue plus R.R. sound effects record plus 10 billboards.

Remember, only LIONEL makes such complete railroading possible. Only LIONEL, makers of the world's finest model trains for 50 years, offers you such a wonderful choice of realistic accessories. Send coupon now.

LIONEL TRAINS, Post Office Box 362
Madison Square Station, New York, N. Y.

Please send me special Lionel Train catalogue offer, postage prepaid. I enclose 25¢ to cover postage and packing.

① The new 36-page full-color Lionel catalogue. ② The new 5½" double-faced record* of whistles, bells, railroad sound effects and Diesel horns. ③ 10 full-color miniature billboards.

Name _____

Address _____

City _____ State _____

*Plays on all 78 RPM phonographs except some fixed spindle or automatic changers.

EXPAND YOUR HOME!

**USE
YOUR
ATTIC**

**Install the
PRECISION
Folding Stairway
at a cost of
\$60 to \$75**

Makes your home more livable by providing extra rooms and storage space in the most economical way. Fits all ceilings—Just saw a 26x54 inch hole in your ceiling, frame the hole with 2x6's, nail the stairway in place and cut off at the calibrated ceiling height.

SIMPLE AND EASY TO OPERATE—A slight pull of the cord and the counter weights silently ease the stairway into down position. The same counter weights return the stairway to its up position with equal ease. **RUGGED AND STRONG**—Construction of No. 1 kiln dried poplar. Brackets, rocker arms and hinges of heavy cast aluminum alloy. All parts numbered and interchangeable. Panel insulated and protected with tough chip board. Steps covered with safety treads. **FITS ANY CEILING**—from 7 feet to 10 feet 3 inches high. Runners graduated to facilitate cutting off for different ceiling heights. **REQUIRES NO ATTIC SPACE**—Full height above attic floor only 36". Folds completely into opening in ceiling. **SHIPPED IN ONE PACKAGE**—Each stairway thoroughly inspected, assembled and ready to install. Shipping weight 130 pounds. Sold by more than 12,000 dealers in U.S.A. and Canada. **APPROVED BY F.H.A. EVERYWHERE.** Mail coupon **TODAY** for descriptive folder and complete information concerning delivery, prices and installation.

**TO MAKE YOUR HOME MORE LIVABLE,
Mail This Coupon today!**

PRECISION PARTS CORPORATION

402 North First Street, Nashville 7, Tenn. PS

Please send me **FREE** folder and complete information on **PRECISION** folding stairways.

Name _____

Address _____



LEARN AT HOME TO MOUNT BIRDS



Animals, Heads, Fishes, Pets; to TAN. Be a Taxidermist. Profit and FUN.

Hunters, save your valuable **TROPHIES**. Mount ducks, squirrels, everything. Learn to TAN for leather and furs. Wonderful **HOBBY** Have a **HOME MUSEUM**. **BIG PROFITS** mounting for others. **INVESTIGATE NOW.**

FREE BOOK With 100 fine game pictures. **NOW absolutely FREE. Write TODAY.**

Send Postal **TODAY** for **FREE BOOK**. State AGE. **N. W. SCHOOL OF TAXIDERMISTRY, Dept. 2611, Omaha, Neb.**



PARTS FOR MILITARY TRUCKS

At A Savings. New **FREE** Catalog
For Jeep, Dodge, Chevrolet, G.M.C., Studebaker

**Brand New—Not War Surplus—Complete
JEEP TOPS and SIDE CURTAINS**

Fits all Military Jeeps. Also adaptable to some Civilian Jeeps. Waterproof O.D. **\$59.50**

AXLES FOR TRAILERS



(Surplus) Heavy Duty axles suitable for building of many types of trailers, farm wagons, etc. Standard width straight axle, 2 inch square and is complete with Hubs, Timken bearings, 6 Hole 750x20 or 825x20 wheels, with- **\$69.50**
out brakes, only.....

Dual Wheels . . . add \$15.00 extra

Hundreds of Other Truck & Jeep Parts and Supplies
All prices quoted good 30 days **FOB, Kansas City**
25% deposit required on COD orders.



UNITED AUTO PARTS CO., INC.
1901 TROOST-GR.1800-KANSAS CITY, MO.

If Ruptured



**CAN YOU HOLD BACK YOUR
RUPTURE LIKE THIS?**

**If You
Can then Don't
Delay Another Day—**
for now it can be controlled
with Freedom and Comfort
in every normal day and
night activity.

ENTIRELY DIFFERENT
Will mail in plain sealed envelope.

FRED B. MILLER
MANUFACTURER

DEPT. P, HAGERSTOWN, MARYLAND

LEARN MEAT CUTTING At Home—In Spare Time



Get into the vital meat industry. Concise, practical Home Training based on 25 years proven instruction methods used at National's famous resident school. Prepares you for bigger pay as Meat Cutter, supervisor, market manager or more money in your own store. Go as rapidly as your spare time permits. Diploma. Start NOW to turn your spare hours into money. Send for **FREE** bulletin today. No obligation.

National School of Meat Cutting, Inc., Div. O-108, Toledo 4, Ohio

1952
**SPEED
and
POWER**
FOR ALL CARS

SPEED & POWER
"SOUP UP"
ANY CAR



LEARN HOW TO GET 150 MILES PER GALLON WITH YOUR OWN CAR! Fascinating construction drawings actually show how you can build fast stock cars, California roadsters, 200 MPH hot rods.

128 Page
Library
Edition
Over 300
Illustrations

EASY STEP BY STEP METHODS help you save by building your own dual manifolds, superchargers, hot cams, water injectors, high compression heads. **50 BREATH TAKING CHAPTERS TELL HOW TO GET LIGHTNING SPEED AND SUPER POWER.** Tuning techniques, speed tricks, economy secrets, formulas for getting racing speed and dynamic power. Includes Information On: Racing frames, reciprocating masses, jet engines, wheel geometry, dynamometers. 34 pages of photos and diagrams show how to re-style and customize all cars. Also info. on dual pipes, gears, fuels, porting, relieving, lowering, balancing.

This Great Book . . . Plus Big 1952 "Speed Equipment Catalog" . . . PLUS 46 Page "Economy Driving Manual" . . . \$1.98 . . . Plus "150 Mpg Booklet" . . . All Four Items Ppd.
NEWHOUSE AUTOMOTIVE INDUSTRIES, Dept. A-11
5807 E. Beverly Blvd. Los Angeles 22, Calif.

NOW *you can learn* TV-RADIO servicing at Home *in your spare time!*



BIG DEMAND FOR TRAINED MEN!

Famous CRESCENT SCHOOL of Radio & Television now offers a *complete* HOME STUDY COURSE for those unable to attend classes! CRESCENT SCHOOL's experience of millions of training hours assures you of the finest training available. New simplified lessons and illustrations — *no previous training needed!*

Get into this high-paying field with a future! Many students start to earn extra cash while learning. Complete the course as quickly as you can learn. Certificate awarded upon completion of course. CRESCENT SCHOOL's free placement service is available to you!



INCREASED EARNINGS



INTERESTING WORK



AN UNLIMITED
FUTURE

PAY AS LITTLE AS
\$5 MONTHLY

Total cost for complete course
as little as **\$100**

Crescent School — one of the largest of its kind! Multi-million-dollar plant in its own 6-story building.



FREE!

Send TODAY for FREE sample lesson & complete details about the Crescent School HOME STUDY COURSE!

SEND COUPON TODAY!

CRESCENT SCHOOL Dept. A-10
500 Pacific St., B'klyn 17, N. Y.

Sirs: Rush free sample lesson & complete details about your HOME STUDY COURSE ... at no obligation to me.

NAME

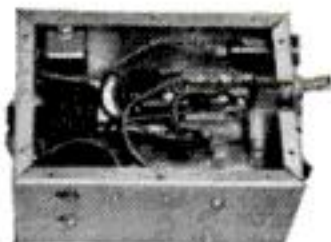
ADDRESS

CITY.....ZONE.....STATE.....

WAR SURPLUS INSTRUMENTS—RADIO—CAMERAS



ELGIN—WALTHAM—BULOVA
Waterproof, shockproof, Type A-11 back watch. 16 J black face, white numerals. Sweep second hand. Used by AAF. Built to exact specifications of U. S. Govt. Genuine War Surplus. State first and second choice as limited quantity available. **\$19.75 ONLY**
Add \$1.98 Federal Tax



MINIATURE COMPRESSOR
2 piston air compressor operated by 24 V series wound motor. Can be used AC or DC. Equipped with dual thermo cutoff for motor and compressor. Positive regulator 2 to 15 PSI. Popoff safety valve. Usable as vacuum or pressure pump. Ideal for jewelers, dentists, air brush work and aerating fish ponds. **\$10.95 NOW**



DESK MICROPHONE
A precision built microphone, usable for intercom, P.A. systems, sound projectors, etc., **ONLY \$2.95**



MAGNESYN INDICATOR
For remote indicating compass. Automatic direction finder. Calibrated from 0 to 360 degrees.

Govt. Cost \$90.00.....**NOW \$3.75**

PHOTO PAPER & FILM

9 3/8" X 200' Bromide enlarging—contrast #1.....**\$3.95 roll**
7" X 125' Aero enlarging—contrast #1.....**\$1.95 roll**
16 mm. X 50' Magazine—Super X, developing included.....**\$2.50**
16 mm. X 100' Super X—negative.....**\$1.50**
War surplus—outdated but Guaranteed. Send your inquiries for World's Largest Selection of Surplus Aerial Camera and Radio Test Equipment.



SOUND POWERED PHONE
No batteries needed. Your voice generates current. O.K. for 25 miles. Perfect intercom for shop, office, farm, darkroom. WAR SURPLUS. Orig. Govt. Cost \$58.00 ea., **\$10.95 NOW**



KOLLSMAN ALTIMETER
For auto or airplane. Used, guaranteed accurate. Govt. cost \$168.00. **\$10.95 NOW**



HEAD PHONES
Govt. specification Head Sets. Used but guaranteed. **ONLY \$1.59**

All merchandise guaranteed. Order these Surplus Bargains Today
20% Deposit on C.O.D.'s Minimum Order \$2.00.

Semlers' ASSOCIATED SURPLUS Dept. P-112 5730 WILSHIRE BLVD., LOS ANGELES 36, CALIF.

MAKE EXTRA MONEY

PLASTICS LEARN AT HOME

LEARN HOW TO MAKE fast selling PLASTIC NOVELTIES FURNITURE JEWELRY SIGNS TOYS LAMPS

There are RICH OPPORTUNITIES for MEN and WOMEN with "know-how" in Plastics. Interstate's amazing new Plastics course tells and shows how to make hundreds of fast selling items out of Plastics. Gives complete training in fabrication, casting, lamination, molding, etc., in simple, easy, step-by-step language and pictures.

START A PLASTICS BUSINESS OF YOUR OWN. No other industry holds such promise for the future. You can make big money manufacturing novelties, toys, signs, etc., in your own home in spare or full time. Don't wait! Learn NOW how Interstate's Plastics Training qualifies you for success in the plastics field.

Write for FREE Information Today!

INTERSTATE TRAINING SERVICE

School of Plastics
PORTLAND 13, OREGON

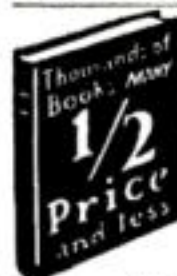
(Dept. C2-M)

EYE-GLASSES BY MAIL

16 Days Trial



Write Today for Free Catalog. Send no Money
ADVANCE SPECTACLE COMPANY
537 South Dearborn Street, Dept. SP-11, Chicago, Illinois



ANY BOOK IN PRINT

Delivered at your door. We pay postage. Standard authors, new books, popular editions, fiction, reference, medical, mechanical, children's books, etc. Guaranteed savings. Send card for Clarkson's 1952 Catalog.

FREE Write for our great illustrated book catalog. A short course in literature. Buying guide of 300,000 book lovers. The answer to your Christmas gift problem. Free if you write Now—Today!
CLARKSON PUBLISHING CO., Dept. PS-1, 1257 S. Wabash Ave., Chicago

HOLLYWOOD DEEP TONE MUFFLERS



DUAL MUFFLERS

for all Fords & Meres
Deep throbbing tone—Reduces back pressure!
Complete Set**\$18.95**

SPEED EQUIPMENT

Save Up To 50%

Racing Camshafts**\$30.00**
Hi-Compression Heads**\$26.00**
Water Injectors**\$6.95**
Hi-Speed Carburetors**\$12.50**
Chrome Carb Stacks**\$1.50**
Lowering Kits**\$2.25**

HUNDREDS OF ITEMS

Order Today by **DEALERS**
Cash or C.O.D. **WANTED**

Get Race Car "Purr"-formance!

BEAUTIFUL LOW MELLOW TONE—New "straight-thru" muffler minimizes back pressure—outlasts ordinary muffler 3 to 1! Rugged steelpack—"Blowout Proof." LEGAL. Easy to install. FOR ANY CAR**\$5.95** (Exhaust Cut-Outs**\$6.95**)

DUAL MANIFOLDS

for all cars



Get up to 20% more power and acceleration! Aluminum DUAL CARBURATION unit steps up efficiency—eliminates fade outs! Guaranteed performance—Easy installation! FOR ALL CARS **\$12.95**

FREE "Soup Up Your Car"

Famous book shows how to double power & gas mileage. Tuning, Racing & Speed Secrets, Economy. How to Build Fast Stock Cars, Racers & Hot Rods!
☐ Handbook FREE with our big Speed Equipment Catalog showing hundreds of items—Sent postpaid for only.....**25c**



ALMQUIST ENGINEERING & MFG.
Milford 522 Pa. **DEALERS WANTED**

A PENNY POSTCARD

CAN PUT YOU IN A FINE BUSINESS!

Demonstrate amazing Air Cushion Innersole Comfort Shoes to friends, neighbors. Never sold in stores. Be our direct Factory Man. Make \$10.00 to \$75.00 or even \$200.00 plus monthly in your spare time. Rush postcard for FREE SELLING OUTFIT. Your future is worth a lot more than 1c—invest in yourself NOW!!!

CONSOLIDATED SHOE SYSTEM
Dept. C1-25 Chippewa Falls, Wis.



30 DAY FREE TRIAL

High Power BINOCULARS

Finest Precision Optics
Featherlight
Money Back Guarantee
Easy Pay Plan
Leather Case Incl'd.

Free! Catalog & Book
"How to Select Binoculars"
Dealer Inquiries Invited

Bushnell Bldg., Dept. PA-31,
Pasadena 1, Calif.

BUSHNELL Binoculars

33 MODELS

\$14.95 up

FREE GUIDE "How to Select Binoculars"

NAME _____ CITY _____
ADDRESS _____ STATE _____

CALENDAR ARTIST—Glamor, excitement, fame, fortune—they're all open to calendar artists! Test your talent for this rich art field!



CARTOONIST—Create comic strips, cartoon books, movies. Really big money in this pleasant field. Test your talent free!



TV ARTIST—Important jobs, fine futures for artists in this young industry. Find out if you have valuable art talent!



Choose your future in Art!

MAGAZINE ILLUSTRATOR—Hundreds of magazines use art work—pay well for it, too. Maybe you have that kind of art talent!



Like to draw or paint? Lots of opportunities for you in the profitable art field! Choose your future—then take the famous Free Talent Test, offered below. *Find out* if you have valuable art talent. You take the Test at home, alone, without fee or obligation. Mail the coupon—today!



ADVERTISING ARTIST—Your ability may be for planning and illustrating advertisements in a big agency. Find out free!

ART INSTRUCTION, INC.

Dept. 11141 • 500 S. 4th St., Minneapolis 15, Minn.

Please send me your Talent Test. No cost or obligation. (PLEASE PRINT)

Name _____ Age _____

Address _____ Phone _____

City _____ Zone _____ County _____

State _____ Occupation _____

C.T.C. TRAINING IN DRAFTING

PREPARES FOR
PROMOTION
MORE MONEY
SUCCESS



"Here I am at work making good money as a draftsman. I'm glad I sent the coupon to Chicago Tech for that Free Trial Lesson and found out how easy it is to learn Drafting in spare time at home. Today, I feel secure in my job. What's more, I feel I'm slated for promotion and more pay."

LEARN IN SPARE TIME—AT HOME!

(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. All the tools you need; drawing outfit included. This tested method—developed over 47 years of C.T.C. progress—prepares men quickly for good positions in industry.



FREE INFORMATION — SEND COUPON

To prove to you how easy it is to learn Drafting at home by the Chicago Tech method, we will send you this **FREE TRIAL LESSON**. No charge for this lesson, now or later. Fill out and mail coupon, or send post card today.

CHICAGO TECHNICAL COLLEGE

P-228 Tech Bldg., 2000 So. Michigan Ave.,
Chicago 16, Illinois

Mail me **FREE** Lesson with information about big opportunities in **DRAFTING**.

Name.....Age.....

Address.....

City.....Zone...State.....

*Yours to make
and keep!*



THIS FOOTSTOOL—BOUDOIR CHAIR AND LAWSON CHAIR!

LEARN UPHOLSTERING AT HOME



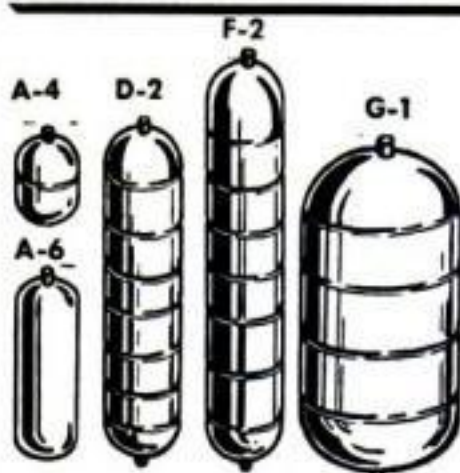
YOUR CHOICE OF 3 POPULAR COURSES
COMPLETE COURSE IN CUSTOM UPHOLSTERY
BASIC COURSE IN CUSTOM UPHOLSTERY
HOME REPAIR AND HOBBY COURSE
YOU LEARN WITH REAL EQUIPMENT—YOU BUILD
REAL FURNITURE—YOU GET A COMPLETE TOOL
KIT & ALL MATERIALS. ALL AT NO EXTRA COST!

FREE! Big, illustrated brochure, sample lessons and details of "PAY AS YOU LEARN" plan. No obligation.

SEND THE COUPON TODAY!

FIELD SCHOOL OF UPHOLSTERY, DEPT. P-11
39 West 19th Street, New York 11, N. Y.
Rush **FREE** illustrated brochure, sample lessons and details of
"PAY AS YOU LEARN PLAN."

Name.....Age.....
Address.....
City.....Zone...State.....



STEEL AIR TANKS

Steel pressure tanks suitable for compressors, pneumatic units, gases, hydraulics, and liquids. Rated at 500 lbs. per square inch pressure. 1/4" standard pipe thread openings on tank ends as shown.

			Size	Wt. Lbs.	Internal Volume	Price
A-4	Stainless Steel	—New	7 1/2" x 5 1/4"	1 1/2	104 cu. in.	\$1.50
A-6	Carbon Steel	—New	14 1/2" x 5 1/4"	3 1/4	280 cu. in.	3.50
D-2	Stainless Steel	—New	24" x 6"	5	500 cu. in.	5.50
D-2A	Carbon Steel	—New	24" x 6"	5	500 cu. in.	4.50
F-2	Stainless Steel	—New	45" x 6"	11	1000 cu. in.	9.50
F-2A	Carbon Steel	—New	45" x 6"	11	1000 cu. in.	5.50
G-1	Stainless Steel	—New	24" x 12"	18	2100 cu. in.	11.50
G-1A	Stainless Steel	—Used	24" x 12"	18	2100 cu. in.	9.50

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25%, balance sent C.O.D.

U. A. S. Corp.

Dept. PS-11 5637 W. 63rd Pl.
Chicago, Ill.

BOYS—IT'S FREE!

"THE WONDERS OF CHEMISTRY"

This exciting new book shows how to amaze your friends with chemical magic, describes many fascinating home experiments, tells of fun, thrills and big future opportunities for boys who know chemistry. Special atomic energy feature. Send today!

THE PORTER CHEMICAL COMPANY
52 Prospect Avenue Hagerstown, Maryland



FOR FUN OR PROFIT

LEATHERCRAFT,
TEXTILE PAINTING,
COPPER TOOLING,
KITS, PROJECTS,
TOOLS, SUPPLIES

REMEMBER

RUSSO for ALL
**LEATHER & CRAFT
SUPPLIES!**

SEND 25c FOR OUR **BIGGEST CATALOG YET** 25c REFUNDED WITH 1st ORDER

RUSSO HANDICRAFT SUPPLIES Dept. 3, 245 S. Spring, Los Angeles 12, Calif

ENORMOUS PROFITS CASTING AT HOME

Write today for **NEW FREE CATALOG**
Learn to cast thousands of perfect figurines, plaques, book ends, ash trays, etc. Start **NOW—NO EXPERIENCE. LITTLE CAPITAL** needed. Earn **GREAT PROFITS** with **X.L. RUBBER MOLDS**. X.L. Rubber, Pts. \$2.50, Qts. \$4.00; Models and enough rubber for 3 molds... \$1.50 postpaid.

PLASTIC ARTS STUDIO 3403 S. Madison
St. Dept. 3
MUNCIE, IND.



FREE
FACTS
SENT

EAT ANYTHING WITH FALSE TEETH

If you have trouble with plates that slip and rock and cause sore gums—try **Brimms Plasti-Liner**. One application makes plates fit snugly and stay that way, because **Brimms Plasti-Liner** is a permanent reliner. It relines and refits loose plates in a way no powder or paste can do. Even on old rubber plates you get good results six months to a year or longer. **YOU CAN EAT ANYTHING!** Simply lay soft strip of **Plasti-Liner** on troublesome upper or lower. Bite and it molds perfectly. *Easy to use, tasteless, odorless, harmless to you and your plates. Removable if desired. Money back if not completely satisfied. Ask your druggist!*

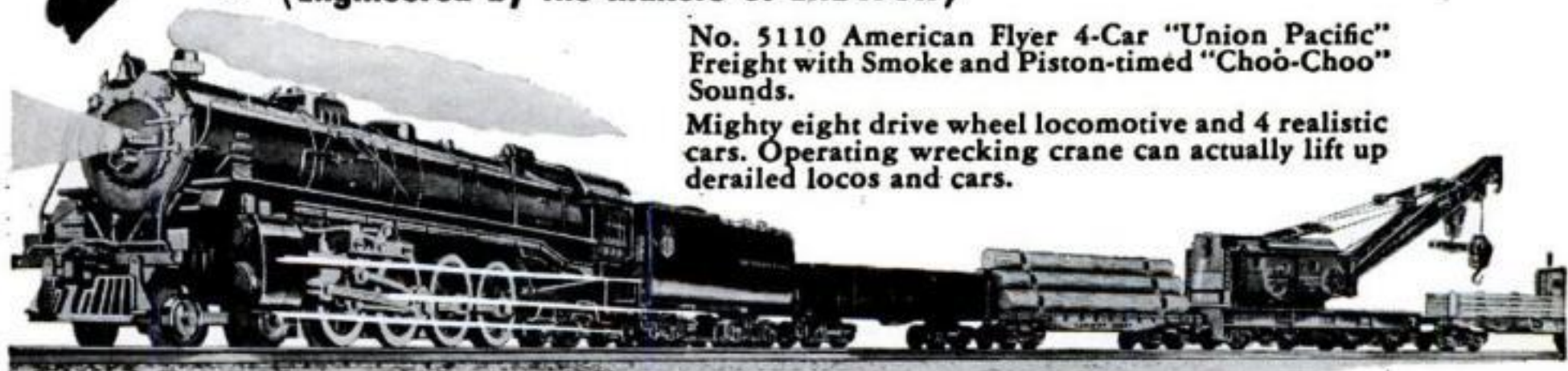


BRIMMS PLASTI-LINER
THE PERMANENT DENTURE RELINER

American Flyer

(Engineered by the makers of ERECTOR)

World's only scale model trains with 2-rail track—smoke—"choo-choo" sounds.



No. 5110 American Flyer 4-Car "Union Pacific" Freight with Smoke and Piston-timed "Choo-Choo" Sounds.

Mighty eight drive wheel locomotive and 4 realistic cars. Operating wrecking crane can actually lift up derailed locos and cars.

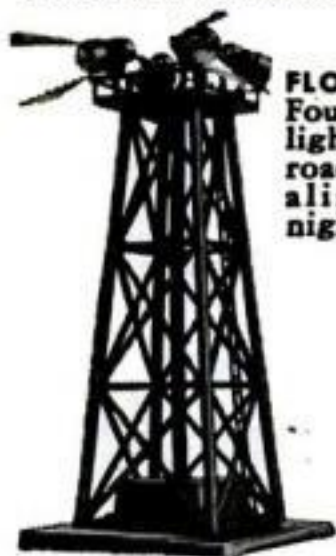
Only American Flyer trains are true scale models throughout—built to 3/16" "S" gauge. Only American Flyers have piston-timed smoke and "choo-choo" sounds—so that the faster your train goes, the more smoke it puffs—the louder are the

"choo-choos." Only American Flyers have the new Air Chime Whistle—exactly reproducing the melodious whistle real railroads are adopting. For the finest in electric trains, look to American Flyer.

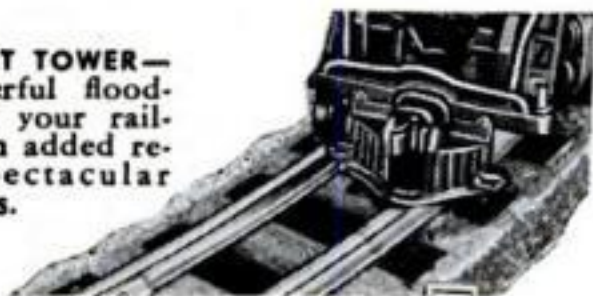
Prices start at \$19.95



American Flyer has the *MOST* and *BEST*. More passenger cars. More freight cars. More accessories. Two kinds of bridges. Automatic log loader. Automatic coal loader. Everything you need to build the railroad empire of your dreams.



FLOODLIGHT TOWER—Four powerful floodlights give your railroad system added realism—spectacular night effects.



REAL 2-RAIL TRACK—Looks like track of real railroad. No old-fashioned third rail in the middle. For further realism, track can be mounted in new American Flyer Rubber Roadbed, finished to resemble real ballast.

No. 5108W American Flyer Santa Fe Diesel Passenger Train with new Air Chime Whistle, Vista Dome Pullman, Two Motors!

Powered by two giant motors, this sleek, streamlined beauty streaks over the rails like the real Santa Fe. Four aluminum illuminated cars.



SEND FOR GIANT TRAIN BOOK

48 big pages. Over 100 color pictures. Cost over \$175,000.00 to produce. Only 10¢.

Gilbert Hall of Science,
234 Erector Square, New Haven 6, Conn.

Rush giant train book. I enclose 10¢.

Name.....

Street.....

City.....State.....

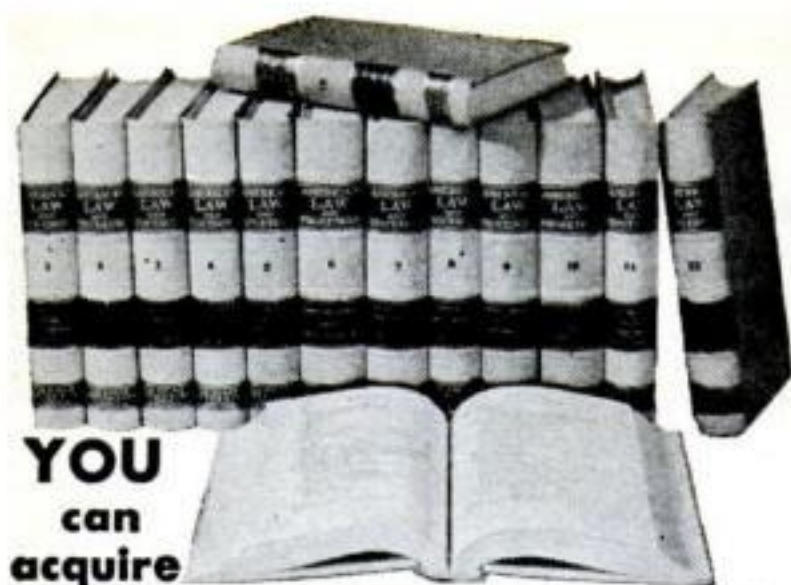
This offer good only in U. S. A.



TALKING RAILROAD STATION—The most thrilling electric train accessory you can own. Produces life-like station sounds: hissing steam, whistle, voice of train announcer, etc. Stops train by remote control. Starts it automatically.



OPERATING STOCKYARD AND CAR—Watch the steers mill around—climb up ramp and enter car—when you press remote control button. Then make them file out of car and down to stock pen again.



**YOU
can
acquire**

LAW NIGHTS AT HOME! L. B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY A Correspondence Institution

417 S. Dearborn St. Dept. 1183-L Chicago 5, ILL.

Send me your two FREE booklets described above, without obligation.

Name.....Age.....

Street.....

City, Zone & State.....

ENGINEERING DEGREE IN 27 MONTHS

Big Demand for Graduates

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and RADIO ENGINEERING (including Television). Hundreds of young men are earning engineering degrees in this recognized institution each year—continuous operation. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough, intense, practical program. Modern laboratory facilities including new physics lab. and modernized wind tunnel. Individualized instruction emphasized.

Approved for Veterans. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter December, March, June, September. Send coupon for free catalog and full information. Enroll now.

—SEND COUPON TODAY—

INDIANA TECHNICAL COLLEGE

6111 E. Washington Boulevard
Fort Wayne 2, Indiana

Please send me free information on B. S. Engineering degree in 27 months as checked.

☐ Aeronautical, ☐ Chemical, ☐ Civil,
☐ Electrical, ☐ Mechanical, ☐ Radio-Television.

Name.....

Address.....



Natural Jargoon . . . Rivals Diamond in Brilliance and Fire Not a Synthetic Stone!

FREE CATALOG

Nature is always right . . . and the Jargoon . . . a natural, mined gemstone proves it. So white, so fiery that Nat. Geographic calls it the closest rival to the diamond . . . the Jargoon, long a favorite of Sultans, is even included in the British Crown Jewels.

Now own a full carat of this naturally beautiful gem set in 14K solid gold for as little as \$11.95 plus tax. Our amazing free catalog gives full details as well as facts about Jargoons and synthetic gems. Get your catalog today!

ORIENT GEM COMPANY DEPT.
154 NASSAU STREET NEW YORK, N. Y. PS-15

NOW YOU TOO CAN BUILD 15 RADIOS

The Progressive Radio "Edu-Kit" is a Home Radio Course in kit form. No previous knowledge of radio is required. No additional parts necessary. Tools included. Easy-to-follow instructions. Theory, Practical Work, Trouble-shooting are taught. Used in many radio schools. Excellent background for television.

Kit includes all parts, instructions, radio tester, electric soldering iron, trouble-shooting guide, quizzes, television book, consultation service. \$19.95 is complete price. Nothing else to buy. Everything you build is yours to keep. All parts and equipment guaranteed.

Order your kit today, or send for further information. You risk nothing. 10 Day Money-Back Guarantee.

Postage prepaid on cash orders. C.O.D. orders accepted in U.S.A.

PROGRESSIVE ELECTRONICS CO.

497 Union Ave., Dept. P.S.-1

Brooklyn 11, N. Y.



A "GOOD HAND" HELPS YOU SUCCEED! LEARN TO WRITE WELL

Handwriting quickly improves with our easy-to-understand picture lessons! Put your spare time to good use; send today for ☐ FREE BOOK, "How to Become a Good Penman", or check volumes wanted below at \$1 each: ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Bird & Design Flourishing ☐ Engrossing Alphabets. COMPLETE SET \$4.50

TAMBLYN SCHOOL of PENMANSHIP
S. A. Ziller, Pres. 438 Ridge Bldg., Kansas City, Mo., USA



GO PLACES

LEARN ANOTHER

LANGUAGE

EASILY — QUICKLY

by **LINGUAPHONE**

World's-Standard CONVERSATIONAL METHOD

**FRENCH
SPANISH
GERMAN
RUSSIAN**
—any of
29 Languages

Are interesting job, travel, armed services', cultural opportunities passing you by because you speak only one tongue? Learn AT HOME any of 29 languages including the ASIATIC—quickly, easily by LINGUAPHONE CONVERSATIONAL METHOD. YOU LISTEN—you learn—you understand—you SPEAK. World-wide educational endorsement: over a million home-study students. FREE BOOK gives fascinating facts. WRITE TODAY! Approved for VETERANS' Training.

LINGUAPHONE INSTITUTE

147-11 Rockefeller Plaza

New York 20, N. Y.

"Goodbye" to **HANGOVER BLUES** Say "Hello" to Season's Biggest **MONEY MAKER!**



Salesmen all over the nation call it "THE GOLD RUSH OF '51." Selling like crazy in Bars, Taverns, Bowling Alleys, Drug Stores, Restaurants, Soda Fountains, Grills and all similar spots.

**Comes in
BIG 25c
and \$1.00
Sizes**

**SET UP THESE DISPLAYS
AND "Stade" SELLS ITSELF!**

**DEATH TO HANGOVERS
GIVES LIFE TO SEASON'S
PROFITS!**

NATIONALLY ADVERTISED!

**We're Telling the World
About STADE
in 50 Great Magazines
with a Combined
Monthly Circulation of
MORE THAN
30,000,000!**

**A GOLD MINE PROFIT SETUP
AS MUCH AS
 $\frac{2}{3}$ OFF LIST!
EXCLUSIVE TERRITORIES
NOW AVAILABLE**

STADE is the kind of counter display merchants like to put up near the cash register and on cigar counters. Small, compact, commanding attention and fast sales. Display holds either 12 plastic vials—each vial containing enough tablets for six Hangovers—or 24 three-tablet packets. And you make a profit margin almost unheard of. Imagine! As much as $\frac{2}{3}$ off list! STADE is on many of the biggest-name drug counters in America. Now we need more men for territories not yet covered. You can be that man. Get in on the ground floor with one of the most sensational new offerings in years. Write—or wire—for full facts TODAY!



Most amazing remedy of its kind ever offered to the American public. Overcomes alcoholic depression. Relieves Headache, Nausea, Upset Stomach, Bleariness caused by over-indulgence in alcoholic beverages. NOT a laxative, NOT habit-forming. Tested and OK'd by doctors!



FULL TIME, SPARE TIME, SIDE LINE

Some mighty fast money makers have hit the Direct Selling field in the past few years, but here is one of the **hot-test** sellers you ever ran into. It's STADE—a "Hangover" remedy that millions have been waiting for. This is not a guess. It's a **fact**—based on the only kind of **PROOF** that counts—sky-rocketing sales records wherever STADE has already appeared!

It's easy to get STADE Display Cartons up on the counter **anywhere** and **everywhere**. Dealers like them because they sell so fast. That means they **REPEAT**. So blast No. 1 is easy **first** sales and blast No. 2 is a sure, steady repeat.

Even newcomers in Direct Selling are coining cash at a rate that makes their

heads swim. There are hundreds of waiting outlets in every territory, and **exclusive** territories are available!

"Old Timers" are dropping whatever they're selling to get in on this STADE demand, building businesses of unbelievable proportions.

This is far too good a deal to "think over." Get that coupon in the mail **right now** while there is still a chance to get "in." If you want to test STADE for yourself, send \$1.00. (\$1.00 will be credited to your account on your first regular order.) But whether or not you want a sample now —GET THE FACTS. Write TODAY!



**GET THIS
CHEVROLET
AS A BONUS**

UNITED PHARMACAL PRODUCTS, Inc., Dept. PR5-11
176 W. Adams, Chicago 3, Illinois.
(Canada: 36 Yonge St., Toronto 1, Ont.)

SEND TODAY!

Rush full facts, Selling Offer, and information on bonus Chevrolet.

☐ I am now selling Counter Display Merchandise.

☐ I have not sold Counter Display Merchandise.

☐ I am enclosing \$1.00. Send me samples of the 25c and \$1.00 sizes of STADE postpaid.

(NOTE: The \$1.00 is to be credited to my account on my first regular order.)

Name

Address

City..... Zone..... State.....

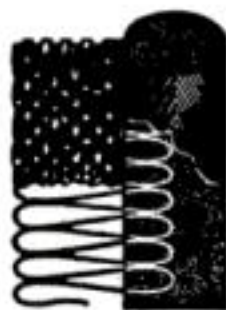


SEAL UP THOSE EXPENSIVE LEAKS
WITH...

INNER-SEAL
WEATHERSTRIPPING



STAYS LIVELIER LONGER... SAVES MORE FUEL



RESISTS WEAR... water-proof neoprene coating preserves it.

TOUGH AND SPRINGY... live sponge rubber bead.

FLEXIBLE, INSTALLS EASY... woven spring-wire attaching strip, fits corners easily, accurately.

WHAT'S THE "JUMP TEST"?

Ask at your hardware or building supply store.

John
Sill
Jowett
Pupil



"Hey, You SKINNY BAG of BONES!"
the boys shouted at me
only A FEW SHORT WEEKS ago

But look at me now, PAL... A
**TROPHY-WINNING ALL-AROUND
HE-MAN** as YOU can be SOON
in 10 Thrilling Minutes a day.

YOU can WIN this
big 15" Silver Trophy
as John Sill just did!

Your Name on it.

Send me
only **10c**

Like John Did—
And get ALL

**5 PICTURE - PACKED
HE-MAN BUILDING
COURSES** and get also

Yes! Today everyone admires John Sill's movie-
star Champion BUILD. His big mighty ARMS. His
heroic CHEST. His broad BACK. His rock-like
TORSO. His wide military SHOULDERS. His newly-
won POPULARITY.



Be A Winner at
Anything YOU
Tackle with
Progressive Power-
SPORTS! JOB!
SCHOOL! FRIENDS!

GEORGE

F. JOWETT

"Champion
of
Champions"



FREE! Jowett's Photo Book of Famous Strong Men!

JOWETT INSTITUTE, Dept. PS-111
230 Fifth Avenue, New York 1, N. Y.

Dear George: Please mail to me prepaid FREE,
Jowett's Photo Book of Strong Men, plus all 5
Muscle Building Courses. "How to Become a Muscular
He-Man." ENCLOSED FIND 10c in complete
payment for EVERYTHING.

NAME.....AGE.....
(Please Print Plainly, Include Zone Number)
ADDRESS.....NO C.O.D.'s
CITY.....ZONE & STATE.....

No Experience Needed To PRINT YOUR OWN POST CARDS

The GEM STENCIL DUPLICATOR saves money... gets results quickly! Hundreds of uses for every type of business and organization. We ship the GEM complete with all supplies, Guide Board for accurate printing and 60-page Book of Ideas at the special low price of only \$8.50 (a \$15 value).

FREE TRIAL OFFER

Use the GEM FREE at our expense! SEND NO MONEY. Write and complete GEM outfit will be sent you postpaid. After ten days, send us only \$8.50 or return the GEM. You must be satisfied!

BOND EQUIPMENT CO.

Dept. 49

6633 Enright • St. Louis 5, Mo.



Our
21st Year

Do You Make These Mistakes in English?

MANY persons say "between you and I"—use "who" for "whom"—don't know whether to use one or two "e's" or "m's" or "r's." Every time you speak or write you show what you are. A command of effective English brings you added advantages, better opportunities.

You can improve your English through Sherwin Cody's 100% self-correcting invention. If you are ever embarrassed by mistakes in grammar, spelling, punctuation, or pronunciation, write for FREE book "How You Can Master Good English in 15 Minutes a Day." No obligation. **SHERWIN CODY COURSE IN ENGLISH, 1811 B & O Bldg., Rochester 14, N. Y.**

Locksmithing & Keymaking

HOME TRAINING OUTFIT INCLUDES KEY MACHINE, SUPPLIES AND TOOLS NECESSARY TO GET STARTED IN YOUR OWN BUSINESS

Excellent full or part time earning opportunities. Professional outfit includes supplies, tools, key cutting machine. Get practical training from Master Locksmiths on house locks, auto locks, padlocks, etc. Learn to cut keys by code, master locks, change combinations, quickly identify key blanks, many profitable "tricks of the trade." Booklet of Information FREE. Write today.

UNITED SUPPLY & SERVICE
3231 Washington Biv'd, Dept. PS-11

Chicago, Illinois



MECHANICAL DENTISTRY

A profession offering unlimited opportunities. Most modern and complete course embracing every branch from Plate to Porcelain Work, which prepares you to work for Dentists or start your own business. Individual instruction—practical training in day or night school. No books—no classes. Catalog upon request.

McCARRIE SCHOOL of Mechanical Dentistry
207 N. Broad Street Dept. 917 Philadelphia, Pa.

Personal To Women With Nagging Backache

Nagging backache, loss of pep and energy, headaches and dizziness may be due to slowdown of kidney function. Doctors say good kidney function is very important to good health. When some everyday condition, such as stress and strain, causes this important function to slow down, many folks suffer nagging backache—feel miserable. Minor bladder irritations due to cold or wrong diet may cause getting up nights or frequent passages.

Don't neglect your kidneys if these conditions bother you. Try Doan's Pills—a mild diuretic. Used successfully by millions for over 50 years. It's amazing how many times Doan's give happy relief from these discomforts—help the 15 miles of kidney tubes and filters flush out waste. Get Doan's Pills today!

15 WAYS TO MAKE MORE MONEY

Raise your earning power! These top-flight books tell you how. Here is the best, most reliable instruction in auto mechanics, radio and TV, drafting, other well paid work. Pick the ones that can help you most and try them out without cost or obligation.

AUTO MECHANICS

Motor Tune-Up Manual

Gives you the **THOROUGH KNOWLEDGE** that the best mechanics have of the principles and function of every part of the modern car engine. Shows just how each part is constructed, how it works, how to test it, locate trouble, make adjustments. Clear, easy-to-understand explanations of electrical principles, useful information on fuels and combustion, handy lists of trouble symptoms and causes, complete summaries of all steps in tune-up jobs, abundant large clear illustrations.

Voltage Regulator Manual

Explains the construction, operating principles and servicing of this important modern part, showing every element and circuit in the regulator, battery and generator, with full details on each of the major makes of voltage regulator and the procedures for testing and adjusting.

Direct Current Motor Manual

Simple, practical explanation of d-c motor parts and new electronic control equipment; shows what type of motor to use, how to select and install brushes, reconnect motors, test for power and losses, all other operating and maintenance details.

Simplified Punch and Diemaking

Two expert toolmakers show how to design and construct all types of punches and dies for fabricating sheet metal. One tool and diemaker of 30 years' experience wrote that he found the book so informative he sat up nights reading it! Full details on materials, specifications, each step in construction.

Make your ideas pay in PLASTICS

Plastic Craft

Hundreds of original designs and ways to use your own ideas in making boxes, table-edgings, lamps, trays, dishes and a multitude of other saleable things. Shows what can be done with the simplest tools, what plastics to use, where to get them, everything you need to know.

Illustrated Jig-Tooling Dictionary

Clear working drawings with concise explanations show you at a glance the construction and use of parts, tools and materials used in manufacturing, the meaning of shop terms. Highly helpful for any kind of shop work in industry. 1000 drawings. Alphabetical for quick reference. Aircraft, other special terms included.

What you want to know about RADIO and TV —for servicing; for FCC exams



Television for Radiomen

Clear, non-mathematical explanation of the operating principles and function of every part and circuit in TV receivers, with full instruction in installation, alignment, testing, adjustment, and trouble shooting.

Television & FM Antenna Guide

How to determine the right type of antenna for the location, where to place it, how to install transmission line for best results. Tested data on all types of antennas including UHF.

Introduction to Practical Radio

The basic essentials taught in the clearest, most practical terms with hundreds of sample problems. Very widely used by radiomen everywhere.

Radio and Television Mathematics

721 problems and solutions show you what formulas to use, what numerical values to substitute, each step in working out radio, TV, and industrial electronic problems. An unexcelled aid for servicing, preparing for FCC exams, or any work in radio and TV.

DRAFTING—learn the best paid, most interesting specialties



Making Patent Drawings

Teaches every detail of a highly paid type of drafting. Provides also a very valuable aid to inventors.

Technical Sketching



A "must" in industry today. Shows how to sketch quickly and accurately as an aid in developing and selling ideas. Teaches each step in planning and executing technical sketches of all kinds.

Illustrating for Tomorrow's Production

How to make isometric drawings, true-scale perspective drawings, exploded views, freehand drawings based on mechanical principles. How to prepare drawings for reproduction.



Aircraft Drafting

Full preparation for work in aircraft drafting rooms. Complete instruction in basic drafting, special aircraft procedures, aircraft engineering data. 1000 illus.

Molesworth's Handbook of Engineering Formulae

The new 34th edition of a book known throughout the world as "the engineer's Bible." Complete, up-to-date data from all branches of engineering, fully indexed. Entirely new illustrations. 1623 pages.

FREE TRIAL

See for yourself how much you'll learn, how much you'll profit from these books. Use this coupon to get copies on approval. If you're not entirely satisfied, you can return them in 10 days, free of charge.

- | | |
|--|---|
| <input type="checkbox"/> Motor Tune-up Manual \$5.50 | <input type="checkbox"/> Plastic Craft \$5.00 |
| <input type="checkbox"/> Voltage Regulator Manual \$2.85 | <input type="checkbox"/> Introd. to Practical Radio \$4.50 |
| <input type="checkbox"/> Direct Current Motor Manual \$3.90 | <input type="checkbox"/> Radio & TV Mathematics \$6.00 |
| <input type="checkbox"/> Simplified Punch & Diemaking \$5.50 | <input type="checkbox"/> Making Patent Drawings \$3.30 |
| <input type="checkbox"/> Illustrated Jig-Tooling Dictionary \$7.50 | <input type="checkbox"/> Technical Sketching \$5.00 |
| <input type="checkbox"/> Television for Radiomen \$7.00 | <input type="checkbox"/> Illustrating for Tomorrow's Production \$5.00 |
| <input type="checkbox"/> Television & FM Antenna Guide \$5.50 | <input type="checkbox"/> Aircraft Drafting \$5.00 |
| | <input type="checkbox"/> Molesworth's Handbook of Engineering Formulae \$6.50 |

The Macmillan Co., 60 Fifth Ave., New York 11

Please send me the books checked. I will either remit in full or return the books in 10 days.

Signed

Address

Employed by

BRAND NEW way to make Extra Money at Home

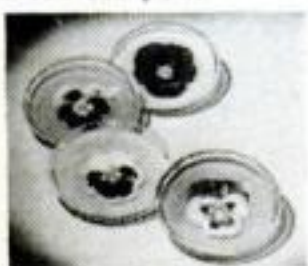
Would \$100.00 to \$250.00 in EXTRA CASH come in handy between now and Christmas? If YES—then grasp this hand of opportunity to cash in on the great demand for these new, gorgeous eye-appealing Castolite Costume Jewelry Creations and Gift Articles that everybody likes and WANTS the minute they see them. Readers of Popular Science will like this offer!



This Cameo Necklace and Earring Set can be assembled at home. Fine profits in store for you!



New Castolite Tie Clasps are very popular. Assemble at home for extra big profits!



Real Pansy Castolite Coasters. SUPER for gifts! Get them finished or make at home.



Personal initial, fish fly and four-leaf clover Key Tags and Purse Pulls are "best sellers."

Get Big Profits before Christmas!

Castolite Creations come in both finished and unassembled form. Best of all, they are THEIR OWN SALESMEN. SHOW THEM to friends, neighbors, others and ACCEPT Big-Profit Christmas Gift Orders. Send 25c deposit for Catalog, Wholesale Price List and New Manual explaining our exciting proved Home-Profit Plan. Money returned if not delighted. HURRY! Write Today.

THE CASTOLITE CO.

Dept. M-2,
Woodstock, Ill.

Play Piano with BOTH Hands the FIRST Day—or Don't Pay!

AMAZING, NEW, PATENTED SELF-TEACHING DEVICE GIVES "SECRET"

You, too, can play piano with BOTH hands, at once! Thousands have learned to play this fast, easy A-B-C way. With the amazing invention, the AUTOMATIC CHORD SELECTOR, there's nothing to it. This is no trick method.



Dean Ross Piano Course today. Consists of 30 illustrated lessons, 50 songs with words and music, special Dean Ross play-at-once arrangements, and the Patented AUTOMATIC CHORD SELECTOR. Only \$1.98 complete. You have nothing to lose and popularity and fun to gain, so mail the 10-Day FREE-TRIAL coupon now!

You actually read and play any sheet music. And, the Patented AUTOMATIC CHORD SELECTOR guides your fingers every note of the way. No scales, no exercise, no boring practice. You play the minute you sit at the piano. In no time at all you're playing Hit Parade numbers, or hymns, or beautiful old ballads . . . or all three! Send for this marvelous



Dean Ross Piano Studios, Inc., Dept. E-6211
45 West 45th St., New York 19, N. Y.

Send Piano Course of 30 lessons, 50 songs, and Patented Automatic Chord Selector. On delivery will pay postman just \$1.98 plus postage. If not delighted, may return Course in 10 days for purchase price refund. The Automatic Chord Selector is mine to keep.

SAVE MONEY! Send payment, we pay postage. Same guarantee.

Name
Address

Free! VITAMIN GUIDE BOOK

Tells how to get — at little cost — the new "Red" Vitamin B-12 recently described in Reader's Digest

Without cost, you can be well informed on vitamins in only 20 minutes' reading. This informative guide book explains the purpose served by vitamins, gives you an understanding of unitage, and will show you how to read a label and compare values so you can get the most for your money. Tells about the newer vitamins B-12 recently dramatically described in Reader's Digest in a story of blood regeneration that thrilled millions. Folks taking vitamins are amazed, on reading this book, that it is not necessary to pay \$4, \$5, \$6 or \$15 for the vitamins they have been using. You, too, once you know how to measure values as explained in this book, can save up to 40%. So, stop buying vitamins blindly. Send postcard today for this free book and catalog of over 100 products to VITAMIN-QUOTA, Dept. 751, 880 Broadway, New York 3, N. Y.

Build your own JET ENGINE!



SEND NO MONEY

Order these plans today

1. JET PROPELLED BICYCLE. Assemble your own. Photo and instructions \$1.00.
2. HOW TO MAKE EXPERIMENTAL JET ENGINES. Seven sheets drawings with information and instructions \$2.95.
3. BOTH OF ABOVE in one order \$3.75. SEND NO MONEY. Order both at once \$3.75 C.O.D. in USA plus c.o.d. postage. Send check or Money Order and we pay postage. Get other information too. Rush Order.

J. HOUSTON MAUPIN, Dept. 66, Tipp City, Ohio



LEATHERCRAFT

PATTERNS & KITS

Complete stock of high quality leathercraft supplies. 4 new handbag patterns—tracings—photo patterns—and complete instructions—\$1.50 postage prepaid.

Send 25c for new catalogue (Refunded with first order)

APACHE LEATHER CO.

Dept. PSX3

2804 E. Washington St., Phoenix, Arizona


RUPTURE



WEB TRUSS CO.

RELIEF...OR YOUR MONEY BACK
Write now for free booklet and pictures of rupture care. You can be helped...work steady, with low cost, easy to wear Web Truss, thousands satisfied.

Dept. PS-11, Hagerstown, Maryland



**WANT TO
SAVE GAS?**

**BE PREPARED IF
RATIONING COMES**

**AMAZING
GANE
NEEDLE**

**TRY ONE FREE
IN YOUR CAR!**

1/2 MILLION NOW IN USE!

MANY GANE NEEDLE USERS REPORT UP TO 25% more mileage, faster pickup, easier starting and smoother idling.

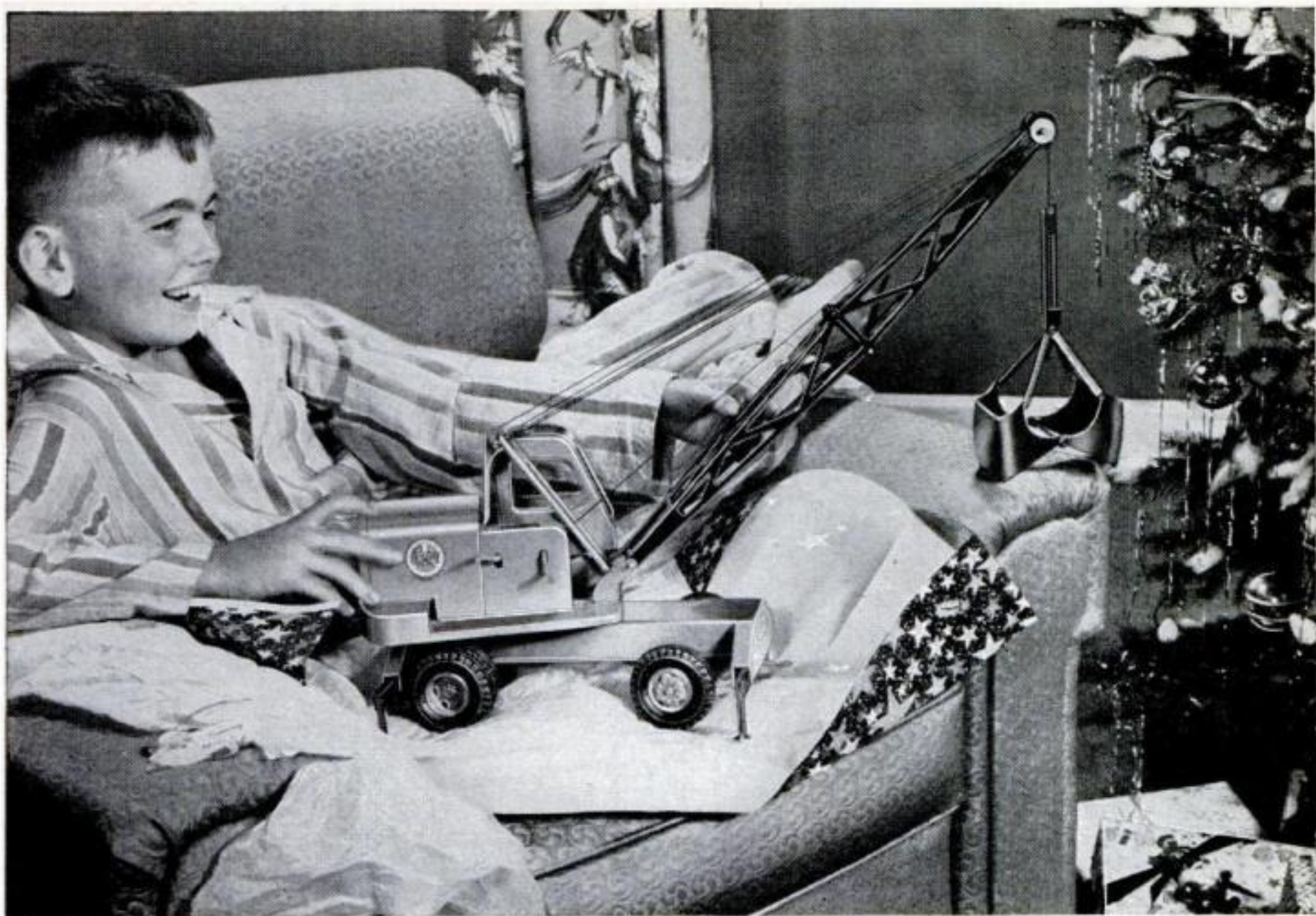
NOW TEST A GANE NEEDLE IN YOUR CAR for ten days, then compare your mileage and performance. If satisfied, send \$1.50 per needle (8 cyl. cars take 2). If not satisfied, just return it—fair enough? Since authorities differ on its merits and some users report no improvement. TRY BEFORE YOU BUY! (Gane Needle replaces idling adjustment screw in carburetors—easily installed in a few minutes.)

WRITE TODAY. ENCLOSE NO MONEY. PAY POSTMAN NOTHING. Just send us your name, address, and make and year of car.

NATIONAL AUTOMOTIVE RETAIL CORP., Dept. H-11
350 W. Washington Blvd. Venice, California

FREE Auto Economy Manual

Tells how to save gas, tires, brakes, etc. Also introduces many new economy products. (Sent absolutely free to all who try Gane Needles.)



This year, make your boy's **BIG** gift a **MODEL** Toy

Here is the Model Unit Crane—an exact working model of the huge Unit Mobile Crane. The cab swings in a 360° circle while cranks control boom, clam shell and sheave block cargo hook. A tow bar attached to the steerable front wheels permits towing by other Model toys. Extension jacks and removable engine housing (for counter-balance weights) enable the Crane to lift more weight than any comparable toy! Price, 13.95—11 Western States, 14.75.

The Model Unit Crane is one of five Model Toys to choose from—each an authorized working reproduction of a famous giant machine. Big in size, big in play possibilities—summer or winter, indoors or out. Constructed of welded, heavy-gauge steel with baked enamel finish, Model Toys will actually outlast other toys 3 to 1.

The Chas. Wm. Doepke Mfg. Co., Inc.
Rossmoyne, Ohio

MORE FUN WHEN YOU OWN THEM ALL

The Road Grader scrapes up earth, the Crane loads it into the Euclid Truck which dumps it for the Heiliner-Scraper to pick up.



AT ALL STORES WHERE BETTER TOYS ARE SOLD



BRAND NEW QUALITY GLASSES

Achromatic lens! Have precision ground optics, light-weight metal bodies. Moisture-Dust proofed.

Easy to Hold Easy to Focus

The ultimate in a fine binocular. Tremendous power. Featherweight (weighs only 24 oz!) Precision made in every detail. COATED, providing sharper, brighter images. Individual focus. Objective lens is 50mm (2 in.) across!

16x50 COATED \$69.50

6x30 Coated	\$27.95
7x35 Coated (center focus)	49.50
7x40 Coated (center focus)	52.50
7x50 Coated	39.50
8x30 Coated	32.50
8x40 Coated	54.50
10x30 Coated	39.50
10x50 Coated	62.00
12x50 Coated	65.00

6 POWER BINOCULAR \$16.95

Also 7 Power \$21.95

COATED! Pocket size—weigh only 4 oz. and 7 oz. respectively! Field of 370 ft. at 1000 yds.! Precision constructed PRISM binoculars. Not Field Glasses. Made of light-weight, durable, black chrome metal. Achromatic lens. Carry the UNITED seal of quality.

15 to 40 POWER \$30.75

COATED

SIX TELESCOPES IN ONE! American-made Wollensak telescope. Instant focussing at 15x, 20x, 30x, and 40x, etc. Turn power tube to click—no guesswork. Telescope measures 9" closed, 27" when extended. Weighs only 18 oz.! Has rustproof chrome tubes, large 40mm objective lens. All 12 optic surfaces are COATED. See 22 bullet holes clearly at 300 feet. Use also for astronomical observation. **\$30.75 price includes tax and fine leather case. UNCONDITIONALLY GUARANTEED.** Try for 20 days at our risk! If not fully satisfied, return for full refund! Cash orders rushed postpaid. On C.O.D.'s include \$2.00 deposit. Add Federal tax. Prices include handsome genuine leather case and straps. **UNITED BINOCULAR CO., 9043 S. Western, Dept. ARF-5016, Chicago 20. (Dealers Wanted)**

LEARN TO DANCE \$1.00

Why be a lonely, unpopular wall-flower? Learn all the smart dances from the most modern to the old favorites—at home. In private without teacher, music or partner. So simple even a child can learn quickly. Tap dancing, Waltz, Collegiate, Samba, Rhumba, Jitterbug and many others, including illustrations. Complete course only \$1.00. Also, delightful old square dances with illustrations for \$1.00. Get each Separate or both for \$1.98. If you order both take your choice of FREE-DREAM BOOK or LOVE LETTERS. C.O.D. orders 25c extra and Postage.

Superior professional taps, both toes and heels \$2.98 prepaid or C.O.D. plus shipping charges. State size, large or small.

ROLDEX, P. O. Box 45, Dept. D-85, Huntington Sta., N. Y.

SECRET FORMULA ... STOLEN!

Gems Inspired by Nature . . . Created by Man

Using Titanium Rutile, International Gem's famed craftsmen took Nature's most precious jewel making secrets to give you more-brilliant-than-diamonds Johannes Gems. FREE CATALOG gives exciting story, tells how to own a full carat of this wonder gem for as little as \$10 plus tax. Lady's or Man's ring, 1ct. Johannes Gem in 14K solid gold, as little as \$25 plus tax. Catalog also shows famous Calcutta Star Sapphires and Rubies. You owe it to yourself to see our catalog before ordering.

WRITE FOR CATALOG

Buy with confidence — member of Jeweler's Security Alliance

INTERNATIONAL GEM CORPORATION
DEPT. PS11 17 Maiden Lane New York 38 N. Y.

Listen to this Record!

Speak FRENCH SPANISH

RUSSIAN • GERMAN • ITALIAN BRAZILIAN • JAPANESE

BIG OPPORTUNITIES await Americans who speak languages. Learn as a child learns—"by listening." The **CORTINA METHOD**, famous for 70 years, teaches you, right at home, to speak like a native!

FREE BOOK The "Cortina Short-Cut" describes this amazing method and **FREE TRIAL** offer. **WRITE TODAY.** State language interested in. Also if Vet, now eligible under G. I. Bill.

CORTINA ACADEMY DEPT. 1211
105 W. 40TH ST. NEW YORK 18, N. Y.

All New Recordings On Unbreakable Records

LATEST TANK MODELS NOW IN PRODUCTION

Authentic pictures 75 Tanks of All Nations in new Tank Catalogue—**NOW AVAILABLE—25c**

All have revolving gun turrets, and many wheels that actually turn. Used by our Armed Services in training.

Scale: 1" to 108"

COMET METAL PRODUCTS CO. Richmond Hill 18, L. I., N. Y.

SHOE REPAIR OFFERS BIG INCOME

LEARN IN 12 WEEKS TIME

Own your own shop. Earn big income. Get into business in this depression-proof work. Hard times only make shoe repairing thrive. 12 short weeks. Packed with practical training on actual shoes and professional machinery. No book studies. No educational or age requirements. Anyone can be a successful shoe repairman—from 18 to 80. Our fast "Learn By Doing Method" is easy, complete. Two modern schools, Los Angeles, Oakland. 150 million customers for shoe repairs in U.S. alone. **Get the facts** on this big paying skilled trade today. Write for free 24-page booklet.

MODERN SHOE REBUILDING SCHOOL, Dept. PS-11A
806 S. Figueroa St., Los Angeles 14, Calif.

High School Course at Home

Many Finish in 2 Years

Go as rapidly as your time and abilities permit. Course equivalent to resident school work — prepares for college entrance exams. Standard H. S. texts supplied. Diploma. Credit for H. S. subjects already completed. Single subjects if desired. High school education is very important for advancement in business and industry and socially. Don't be handicapped all your life. Be a High School graduate. Start your training now. Free Bulletin on request. No obligation.

American School, Dept. H-846 Drexel at 58th, Chicago 37

Locksmithing AND KEY MAKING

Now Made Easy! Practical up-to-date course teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lessons for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 easy illustrated lessons. Full price only \$4.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Nelson-Hall Co., Dept. L-1
210 S. Clinton St., Chicago 6, Ill.

Complete course \$4.95
... now only \$4.95

Get into Good Paying AUTO BODY and FENDER WORK

BIG DEMAND in Auto Body and Fender work. Start training now in your spare time at home for good pay work. Practical shop experience included. U.E.I. Training covers metal work, welding, painting, etc. Placement service—or we will show you how to start your own shop. Behind U.E.I. TRAINING is a large national organization founded 1927. Write today for **FREE FACTS**—No obligation.

Write For Free Facts

AUTO-CRAFTS DIVISION • UTILITIES ENGINEERING INSTITUTE
2523 SHEFFIELD AVE., DEPT. XM-10, CHICAGO 14, ILLINOIS

AMAZING NEW LOW PRICED BURGESS ELECTRIC ALL IN ONE JIG SAW—SANDER—FILER!

Makes These and Dozens of Other Useful and Decorative Articles for Your Home, Garden, or Gifts—It's Easy—It's Fun—It's Profitable!

The Gift
of Gifts for
Men & Boys
from SIX
to SIXTY



**Complete with Built-In Blower and
Powerful 110-125 A.C. Motor!**

Now only

\$12⁹⁵

Complete with
Built-In Motor



Even if you never handled a tool of any kind, you can now make hundreds of useful and ornamental objects with this simple, safe Burgess All-in-One electric Jig-Saw Combination! That's right! You can *easily* make toys, models, tie racks, book ends, shelves, cornices, trays—literally *hundreds* of things to use in and around your home . . . to give as gifts . . . or to help you earn extra money!

**BIGGEST BARGAIN YOU EVER SAW
IN HOBBY TOOLS!**

This amazing power tool is actually a *complete* portable Home Workshop—in one compact unit! It

SAWS the most intricate patterns. It SANDS flat or beveled surfaces perfectly! It FILES metal, wood, or plastic. The sander and saw table tilts to 45 degree angle, and the automatic Blower Attachment keeps the work free from saw dust and filings while you work! It saws and sands straight—or at any angle up to 45 degrees. The powerful built-in fractional h.p. motor drives blade at about 3400 strokes per minute—really makes the work fly!

A precision tool, small enough to set anywhere, strong enough to do a real job, low enough priced to make it a big-paying investment!

- PRECISION BUILT
- JUST PRESS BUTTON—AND SAW, SAND, FILE!
- STEEL AND ALUMINUM CONSTRUCTION



TRY IT 10 DAYS FREE! Send No Money

Comes complete with 110-125 A.C. motor, UL approved, 6 ft. cord set, push-button switch, extra blades and sanding discs, one jig-saw pattern, and instruction book. Examine this combination JIG SAW, SANDER, FILER—*without risk!* Send no money now—just mail coupon. On arrival, pay postman only \$12.95 plus postage and handling. (If you wish, we'll also include 89 different patterns for only \$1.00 extra). Try it in your own home—and if *not* completely satisfied, return it within 10 days for purchase price refund! Order NOW—for yourself, or as a gift for any boy from 6 to 60! Mail coupon *today!*
BURGESS STORES, Dept. J-38, 182 No. Wabash Ave., Chicago 1, Ill.

**BURGESS STORES, Dept. J-38
182 No. Wabash Ave., Chicago 1, Ill.**

Please send me the Burgess All-in-1 JIG SAW, SANDER, FILER for free examination. On arrival, I will pay postman only \$12.95, plus postage and handling. If not completely delighted, I will return it within 10 days for purchase price refund.

☐ I also wish to receive 89 different patterns for only \$1.00 extra.

Name.....

Address.....

City.....Zone.....State.....

☐ Check here if you are enclosing full remittance. We pay all postage and handling charges. Same 10 day money-back guarantee.

CHOOSE AS YOUR COLLEGE CAREER

ELECTRICAL ENGINEERING

- ★ MAJOR IN ELECTRONICS OR POWER
- ★ B.S. DEGREE IN 36 MONTHS



Career opportunities are at an all-time high in Electronics. Prepare now for engineering employment opportunities predicted for 1954. This 48-year-old College of Electrical Engineering offers a proven plan to prepare you for a successful future.

Become a Radio or Electronics Technician in 12 Months. Prepare for a wide range of career objectives. In 6 additional months become a TV Technician.

TECHNICIAN'S COURSES APPLY FULLY TOWARD YOUR B. S. DEGREE . . . also complete in themselves. Military, practical, or prior academic training evaluated for advanced credit. B. S. Degree in 36 months.

MILWAUKEE SCHOOL of ENGINEERING

MILWAUKEE SCHOOL OF ENGINEERING PS-1151
1025 N. Milwaukee, Milwaukee, Wis.

Without obligation, send 1951 Catalog for Electrical Engineering, B. S. Degree, major in ☐ Electronics ☐ Power; plus Occupational Guidance Bulletin in: ☐ Radio-TV ☐ Electrical Power ☐ Welding ☐ Heating, Refrigeration, Air Conditioning.

Name..... Age.....
Address.....
City..... Zone..... State.....
If veteran, indicate date of discharge.....



**SMALLEST .22
AUTOMATIC \$35.00**



.22 VB Baby Automatic Bernadelli. Meets sportsmen's demand for Pocket Automatic using .22 LONG or SHORT cartridges. State preference. Packs a punch! Easy to carry. Weighs 9 oz. 6 shot. 2 1/8" barrel. 4 1/8" overall. Blued. Non-projecting sights. Delivery Dec. 1st. Orders must state "I am not a minor, alien, fugitive from justice, under indictment, or been convicted of a crime of violence." Shipped F.O.B. C.O.D.'s cannot be accepted.

UNITED ARMS, 9043 S. Western Ave., Dept. FA-755, Chicago 20.

*New
Advertising
Machine*



Prints & Illustrates Gov't Post Cards

FREE Learn how thousands of business men, in every line, are boosting sales in spite of conditions—with ad messages—printed and illustrated in a few minutes on gov't post cards—with amazing new patented **CARDMASTER**. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine, built to last for years. Low price, sold direct. Guaranteed for five years. Send name today.

SEND NAME We'll send **FREE** illustrated book of money-making IDEAS for your business and complete, unique advertising plans. **RUSH YOUR NAME TODAY.**
CARDMASTER COMPANY
1920 SUNNYSIDE, Dept. 1611, CHICAGO 40, ILL.

Improved Americanized

JUDO

"THE BIGGER THEY ARE—
THE HARDER THEY FALL!"

Two Big Books Clearly Illustrated. Over 1200 Show-How Photos. Many New Holds! 71 Complete Lessons.

Protect yourself and others. Size and strength mean nothing. Knowledge and skill enable you to master any situation even against biggest bullies and armed thugs. Illustrations showing each hold from start to finish. Complete satisfaction guaranteed or your money refunded.

NOW BOTH BOOKS ONLY \$5.00 pp'd.
or \$3.50 ea. \$1.00 deposit with C.O.D.'s.

No C.O.D.'s outside U.S.A.

IMPROVED JUDO, INC. Dept. PS-11 P.O. Box 7355,
Sta. L, Los Angeles, Calif.



**10 DAY
FREE
TRIAL!**

IMPROVE YOUR PLAYING PIANISTS



Greatly improve technic, sightreading, accuracy, memorizing through remarkable Mental-Muscular Co-ordination. Quick results. Practice effort minimized. Used by famous pianists, teachers, schools, students throughout U.S. and in 32 foreign countries. . . . Complete classical or modern popular piano courses. Harmony, composition, arranging, choral conducting, Diploma studies. Unique, practical, easy to apply methods insure success (our 25th year), worthwhile achievement, rapid progress.

Adults write today for **FREE** booklet

BROADWELL STUDIOS Dept. 9L, Covina, Calif.

TASOPE PHOTO-ENGRAVING PLANTS



MATERIAL COST
OF THIS CUT 1/2¢
SELLING PRICE
\$1.00 AND UP

Establish your own profitable **PHOTO-ENGRAVING** business. Make cuts for newspapers printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for **FREE** catalog.

TASOPE DEPT. PS-11, AURORA, MO.



SEND FOR THIS FREE!

Make money. Know how to break and train horses. Write today for this book **FREE**, together with special offer of a course in Animal Breeding. If you are interested in Galting and Riding the saddle horse, check here () Do it today—now.

BEERY SCHOOL OF HORSEMANSHIP
Dept. 5811 Pleasant Hill, Ohio

GO Anywhere with **PEACE OF MIND!**

ST. CHRISTOPHER

Medal Enshrined in
Lifetime Lucite!

**PERSONALIZED with
CHROME INITIALS!**

Here's the ideal way to carry the protection of St. Christopher no matter where or how you travel! Jewel-like **KEYFOB**—on one side, approved St. Christopher Medal enshrined forever in clear, sparkling Lucite. On the other side, your own (or a loved one's) initials (2 or 3) in gleaming raised chrome letters. Medal sealed in permanently against soil, wear, moisture. Initials fused on forever. Perfect for all keys or pocket or purse piece. A thoughtful gift for those in service. Send cash with order, we mail postpaid. (No C.O.D.) Print initials plainly. Satisfaction guaranteed. Order today.

MERIT SALES, Dept. 110, 4225 Eldone Dr., Baltimore 29, Md.



Only \$1.25 ea.
TWO for \$2.25

WOULD YOU LIKE TO GET PAID FOR
"GIVING AWAY"
FIRST QUALITY FULL FASHIONED NYLONS
AT 49¢?



Imagine the money you can make! Sounds impossible, but that's all they cost if they run or snag within guarantee period up to **THREE WHOLE MONTHS!** What's more, this amazing low cost **INCLUDES** your commission, huge bonus and even the postage! Here is a miracle come true!

This isn't selling. It's giving something away. Yet, **YOU** get paid for doing it! Yes, you not only pocket an advance liberal cash commission but can easily earn a big bonus that increases your earnings up to 40%.

Women today buy over **TWO MILLION PAIRS** of nylons **EVERY DAY.** Many women average a pair a week. Stockings are bought more often than any other type of wearing apparel. Think how delighted any woman would be to learn about the amazing Kendex nylons.

It makes no difference whether you ever sold before or not. We don't care if you are 18 or 80—whether you have one hour or 50 hours a week to spare. You can make a wonderful steady income either full or spare time.

There is nothing for you to buy or deliver. You don't risk a dime. Pay nothing now or later. Just mail the coupon, that's all. We'll send you **FREE SAMPLE STOCKING** and complete money-making outfit postage prepaid. Show women how they can save at least half of their hosiery cost and write orders. We deliver and collect. Could anything be easier? If you don't make money quicker and easier than you ever did, throw the whole works away! Can we say more?

FREE SAMPLE STOCKING

KENDEX

CORPORATION

BABYLON 149, N. Y.

Date.....

Kendex Corporation
 Babylon 149, N. Y.

Send me, absolutely free and postage prepaid, your complete money-making outfit including free sample stocking. It is understood I am under no obligation and if I am not satisfied with the money I make, I will throw away the whole outfit.

Name.....

Address.....

City.....Zone.....State.....

Learn ELECTRIC APPLIANCE REPAIR IN YOUR SPARE TIME AT HOME



START YOUR OWN BUSINESS

WITH A POTENTIAL MARKET OF 50,000,000 CUSTOMERS

New shop-method, home training system gives you electrical know-how that used to take years to learn. Learn at home by building valuable testing kits, repairing your own and neighbors' appliances. It is not unusual for appliance repairmen to charge on the basis of \$5.00-\$6.00 an hour.

FREE ILLUSTRATED BOOK
Shows you how you learn every phase of electrical appliance. How to make money while you learn. Write today for your FREE copy.

CHRISTY TRADES SCHOOL
Dept. D-901
4432 North Kedzie Ave., Chicago 25

ONE BUSINESS THAT IS NOT EFFECTED BY STRIKES, DEPRESSIONS OR POLITICS

Would YOU Like to Make \$1,000 A MONTH?

That's what Stanley Hyman made selling the amazing new **PRESTO Fire Extinguisher!**

OVER 11,000 people died in fires last year. An eager public has been waiting for a practical new kind of fire extinguisher. Now it's here! Tiny "Presto" does the job of bulky extinguishers that cost 4 times as much and are 8 times as heavy. Ends fires fast as 2 seconds. Fits in palm of hand. Never corrodes. *Guaranteed 20 years!* Sells for only \$3.98!

You can make good money showing this new discovery to civil defense workers, owners of homes, cars, boats, farms, etc. and to stores for re-sale. Stanley Hyman reports making over \$1000 a month. H. J. Kerr, \$20 a day. William Wydallis, \$15.20 an hour.



Science's New Midget Miracle "PRESTO"

What's the secret of "Presto's" amazing power? It's a new war-born wonder chemical found to be 1.5 to 6 times as effective as chemical contents of other extinguishers on an equal weight basis. Makes possible, for the first time, an extinguisher that is small, light, and amazingly effective. Help supply the demand for this important new discovery. Write for FREE Sales Kit. No obligation; no capital required. But don't put it off. Every day you hesitate may cost you \$10, \$15, or even \$50 you could be making. Send postcard or letter to: **MERLITE INDUSTRIES, Inc., Dept. 1111, 201 East 16th St., New York 3, N. Y.** IN CANADA: **Mopa Co., Ltd., 371 Dowd St., Montreal 1, P.Q.** (If you want a regular Presto to use as a demonstrator too, send \$2.50. Money back if you wish. Returnable for FREE refills.)



STANLEY HYMAN

WAR SURPLUS OPTICAL BARGAINS

35 POWER ERECTING MICROSCOPE

Amazing clarity. "All-Position" Universal mount. 3" of working space from objective to platform. Prism Erectors give you an erect image—exactly as your eye sees it. Ramsden Eyepiece permits fine precision focusing. 3-Element color corrected objective—1" diameter. Microscope body is of brass with black crackle finish. 6 1/2" long with base 7"x9". Easily worth \$75.00. Stock No. 970-N. \$29.50 Postpaid

SLIDE PROJECTOR SETS.

Consists of all unmounted slides you need to make the following size projectors:

Stock #4029-N—35 mm.	\$2.85 Postpaid
Stock #4038-N—2 1/4"x2 1/4"	\$3.35 Postpaid
Stock #4039-N—2 1/4"x3 1/4"	\$3.35 Postpaid

SIMPLE LENS KITS

Include plainly written, illustrated booklet showing how you can build lots of optical items. Use these lenses in photography and for dozens of other uses in experimental optics, building TELESCOPES, low power Microscopes, etc.

Stock #2-N—10 lenses	\$ 1.00 Postpaid
Stock #5-N—45 lenses	5.00 Postpaid
Stock #10-N—80 lenses	10.00 Postpaid

We Have Literally Millions of War Surplus Lenses and Prisms for Sale at Bargain Prices. Numerous Types of Instruments. Tool Write for FREE CATALOG-N.

EDMUND SCIENTIFIC CORP., BARRINGTON, N. J.




"ERECT-A-CLOCK"

Make your own Christmas gifts and save money! The kit, attractively boxed, contains all metal, imported precision Swiss movement with complete instructions for assembling all the interesting parts of this pendulum clock with pine cone weight. It's easy to put together and fun for anyone! We'll pay postage on receipt of check or money order.

\$4.95

KLEIN JEWELERS
844 So. Broadway, PS-1151, Los Angeles 14, Calif.
USEFUL - EDUCATIONAL - THRILLING



MAKE YOUR OWN!

WITH

GRIFFIN LEATHERCRAFT KITS

Best assortment of tools, materials in U. S. A. ! Send 25¢ for 116-page catalog. (money refunded first order)

GRIFFIN CRAFT SUPPLIES
SINCE 1924
5626-B Telegraph Ave., Oakland 9, Calif.



Bar Bells

BUY DIRECT FROM FACTORY **\$8.95 up**

Approved and Recommended by Karl Koberle. (Foremost Ex-Army Instructor on Weight Training.) Write for free booklet and price list.

INDEPENDENT IRON WORKS
2416 E. 23rd. Street, Dept. C, Los Angeles 58, Calif.



"How to Make Money with Simple Cartoons"

A book everyone who likes to draw should have. It is free; no obligation. Simply address **FREE BOOK**

CARTOONISTS' EXCHANGE
Dept. 1911-D Pleasant Hill, Ohio



IMPORT PAYS BIG

MEN—WOMEN! Learn from established World-Trader. Opportunity for your own world-wide import-export business by mail-order without capital from home, anywhere; or travel abroad—profits unlimited. No previous experience needed. Step-by-step method makes learning easy in spare time. **FREE details—Write NOW!** Airmail reaches us overnight.

MELLINGER CO., 1715-H Westwood, Los Angeles 24, California.



**SPECTACLE
NEVER BEFORE
FILMED!**

•
**GIANT PLANET
COLLIDES WITH EARTH!**

•
**ENORMOUS EARTHQUAKES
SWALLOW WHOLE
CONTINENTS!**

•
**TIDAL WAVES FLOOD
ENTIRE COUNTRIES!**

•
**SPACE SHIP
LEAVES EARTH!**



Paramount presents



In Earth-Shaking Color by **TECHNICOLOR**

WHEN WORLDS COLLIDE

PRODUCED BY
GEORGE PAL · RUDOLPH MATÉ
SCREENPLAY BY SYDNEY BOEHM

•
Most Amazing Story That Science Or Fiction Ever
Imagined . . . Based On The Sensational Book By
EDWIN BALMER and PHILIP WYLIE

NOVEMBER 1951 49



● IF YOUR CAR BURNS
● TOO MUCH OIL...

HOLT'S GET
Piston Seal

AN ENGLISH IMPORT

10,000 miles of motor oil economy in every tube. Restores compression, stops piston slap, improves engine performance, and pays for itself many times over in reduced oil consumption. Endorsed by automotive experts everywhere—improves all internal combustion engines. Anyone can install—just remove spark plugs, insert rubber tube and squeeze. Send for complete details—FREE!

AUTOMOTIVE AIDS CO., DEPT. 5-S
201 East 5th St., Plainfield, N. J.

for
QUIET CAREFREE DRIVING

AUTOMOTIVE AIDS CO.
201 East 5th St.
Dept. 5-S, Plainfield, N. J.
RUSH DETAILS ON PISTON SEAL—FREE!

NAME.....
ADDRESS.....
CITY.....STATE.....

BROOKS can make a career for **YOU**

LEARN INVESTIGATIVE PHOTOGRAPHY
LEGAL—CRIMINAL


Securing evidence through ballistic photos, fingerprints, scenes of accidents and crimes is **INTERESTING • EXCITING • PROFITABLE**

At Brooks Institute, you learn by doing. You use the finest up-to-date equipment and you're trained by instructors, each an expert in his field. Brooks is the only recognized photographic school offering this opportunity to learn legal and criminal photography.

Opportunity knocks — with the click of a shutter. Start your Investigative Career by investigating today... Write for our **FREE** booklet and full information.

BROOKS
INSTITUTE OF
PHOTOGRAPHY

SANTA BARBARA • CALIFORNIA
"PHOTOGRAPHER'S PARADISE..."
Where the mountains meet the sea.



LEATHERCRAFT
TEXTILE PAINTING
COPPER TOOLING

PAY-OFF

Yes, these crafts "pay off" in pleasure and profit. You can do it! Everything you need in Kit Kraft's big illustrated catalog.

Send 10c (credited to first order) for catalog today!

KIT KRAFT 7377 Melrose Ave., Dept. 37
Hollywood 46, California



CASH IN YOUR SPARE TIME

BIG MONEY IN OWN BUSINESS
YOU CAN MAKE UP TO \$40 A DAY sharpening and setting circular saws for factories, builders, lumber yards — with **NEW BELSAW COMPLETE CIRCULAR SAW SHOP**. LOW COST, Sharpens 4 to 5 saws per hour, no experience needed, complete instructions. Send today for **FREE** Catalog.

BELSAW MACHINERY CO
4404 Field Bldg. Kansas City 2, Mo.



FIX LOCKS

Learn Locksmithing and Keymaking from Experts in Your Spare Time at Home! Locksmiths in big demand! No layoffs, no slow seasons! Age or physical handicap no disadvantage. Year-round, steady income in this permanent, respected field. Full or part time. Practical, illustrated lessons show you how to make money even while learning! All materials and special tools supplied. Send for **FREE** BOOKLET.

LOCKSMITHING INSTITUTE, Dept. PS-23
15 Park Ave. Rutherford, N. J.



BEING PUSHED AROUND??

Why take any more nonsense from bullies, wise guys and other pests? The next time they try to act smart—give them the surprise of their lives! It's easy when you know **POLICE JIU JITSU**! This complete, fully illustrated course comes to you in one volume. The same as taught to police, marines, "G" men, soldiers, sailors and members of the U. S. Coast Guard. By all means, just pin \$1 to this ad and we will send **POLICE JIU JITSU** to you postpaid by return mail. Satisfaction guaranteed or your money back.

BOOKS PUBLISHING CO., 56 W. 24th St., N.Y. 10



HOME MOVIE FILMS **ALL KINDS!**

We have the films you want! See 8-16 mm. Silent and Sound—all types—with our sensational new Low-Cost Plan. Send only 25c for Sample Film. Special List **FREE!**

HOLLYWOOD FILM EXCHANGE
5864 Hollywood Blvd. Hollywood, Calif.

FIRST AID FOR TV SET OWNERS!

H. G. CISIN's "TV DOCTOR"
Shows you how to fix your own set rapidly and **SAFELY!**

YOURS TO TRY 5-DAYS FREE!
Save money, throw away service contracts! Here's a real "fix-it-yourself" book—an amazing, quick, copyrighted method of locating & fixing TV troubles. Written by a noted inventor & educator in language you can understand.

TUBES CAUSE 80% OF TV TROUBLES!
"TV DOCTOR" shows you how to quickly locate and change all defective tubes with complete safety.

WITHOUT EXPERIENCE!—PICTURES & TEXT MAKES FIXING IT YOURSELF EASY
Reveals many closely guarded **TRADE SECRETS**. Lists over 123 trouble conditions. Method applies to all TV sets, even newest RCA's, Philco's or any 2,000 models, old and new. Copyrighted **TROUBLE SHOOTING GUIDE** pin-points hundreds of troubles.

11 money-saving, fact crammed, detailed, illustrated chapters include: practical ways to combat interference & ghosts, how to appraise & buy a TV set, valuable information on antennas, lead-ins, color TV, explains TV terms, lists names & addresses of TV mfgs.—a veritable encyclopedia.

Save Expensive Service Calls!
Be assured of Continual TV Pleasures!
Only \$1.—you'll say it's worth hundreds.

SPECIAL OFFER: A new "TV DICTIONARY" explaining TV terms and selling for 50c; H. G. Cisin's famous "TV TROUBLE SHOOTING METHOD," which trains you to be a TV diagnostician & TV serviceman... sells for \$1. **PLUS** the "TV DOCTOR"—all 3 for only \$2, postpaid... you save 50c!

H. G. CISIN, Consulting Engineer,
(Dept. PS-4), 200 Clinton St.,
Brooklyn 2, N. Y.

☐ Enclosed find \$2, full payment for "TV DOCTOR," "TV TROUBLE SHOOTING METHOD," & "TV DICTIONARY," rush copies postpaid.
☐ Enclosed find \$1, in full payment for "TV DOCTOR," rush copy postpaid.

Name.....
Address.....
City.....Zone...State.....

ORDER NOW POSTPAID



I'll show you how to **EARN BIG MONEY IN PLASTICS** without tools or machinery!

A NEW HOME INDUSTRY

NEVER BEFORE has such a **GREAT OPPORTUNITY** like this been offered! The **CHANCE OF A LIFETIME!** The chance to learn and **START** a new, fascinating and **HIGHLY PROFITABLE** business of your own! We have started **THOUSANDS** of ambitious people in this wonderful and thrilling new business because the work is so easy and pleasant (many turn it into a profitable hobby), requires only a **FEW** dollars investment, can be started **ANYWHERE** by **ANYONE** . . . at home, garage, basement, den, shop, etc., and most important, **WITHOUT TOOLS OR MACHINERY** you can produce in **QUANTITY** exceptionally attractive and desirable plastic things of such great variety and usefulness beyond your imagination! All this valuable knowledge and instruction is yours **FREE** . . . we teach you, help you get started and **buy part of your production!** We also help you obtain **DEFENSE WORK!**

MAKE ANYTHING

This new method of creating unlimited quantities of useful things without machinery is **CASTING** . . . the extremely simple process of pouring liquid plastics into molds; the entire method is as easy as pouring water out of a glass. No machinery or tools required! In a few minutes the liquid turns into a beautiful solid, hard, durable, colorful or transparent plastic in the form of Jewelry, Novelties, Gadgets of every shape and form, Machine Parts, Fishing Lures, Bookends, Cig. Lighters, Tools, Dies, Handles, Knobs, Pensets, Figurines, Souvenirs, Toys, Dolls, Baby Shoes . . . **A THOUSAND USEFUL THINGS!** Some of our plastics are transparent and sparkling clear, ideal for imbedding flowers, photos, curios, etc. Others are like beautiful Ivory,

Ebony, Marble, Ceramics, Etc. The field is really **UNLIMITED**. Practically anything your imagination can create can be **CAST** with our plastics, one or a thousand!

BILLIONS FOR DEFENSE

The government has started the greatest defense program in history! **BILLIONS** are being spent! Our liquid plastics can be used in **THOUSANDS** of vital defense applications. With our catalog we will include instructions how **YOU** can obtain defense work, how **YOU** can take part in this tremendous program to insure the future of America! A grand opportunity to combine patriotism and profit! A grand opportunity of obtaining **THOUSANDS OF DOLLARS** of defense work!

1000 OPPORTUNITIES

Regardless what you are doing now you can get into the **CASTING BUSINESS** in your spare time or evenings; we assure you, once you do, you will be eagerly devoting all of your time to this very easy, fascinating and **HIGHLY PROFITABLE** business. Countless letters from enthusiastic busy **PLASTICAST** users testify to successful businesses developed as a result of answering this ad! **BUT LET US PROVE IT:** send only 25c for our big 48 page catalog of Casting Materials, Molds, etc. We will also send you, absolutely **FREE**, an attractive **CASTING** to show you what can be done with our plastics in a few minutes! **IN ADDITION**, we will also send you a valuable instruction book giving details on the **ART & BUSINESS OF CASTING!** Yes, all this for only 25c, but write for it today . . . *this may be the lucky coin that will start the most fascinating and profitable phase of your life!* Don't delay anything that can mean so much to your future—write today.

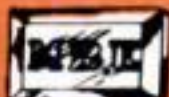
PLASTICAST CO. (Dept. A)

P. O. Box 6737
Chicago 80, Ill.

Write to
either address

P. O. Box 987
Palo Alto, Calif.

CANADIAN CUSTOMERS: Send 35c for catalog to Canadian Ind. Plastics, 1056 1/2 W. Pender St., Vancouver, B. C.



FREE



LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation



The steady dependable trade of Meat Cutting taught easily in 8 short weeks. You **LEARN BY DOING** under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, **PEOPLE MUST EAT!** Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established over 25 years. Get National training **NOW**. Pay your tuition in easy weekly payments

after you graduate. G. I. approved. Send coupon for **FREE** 52 page school catalog—**TODAY**.

National School of Meat Cutting, Inc.
Dept. 51-Y, Toledo 4, Ohio

Send me your **FREE** school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesmen will call.

Name.....

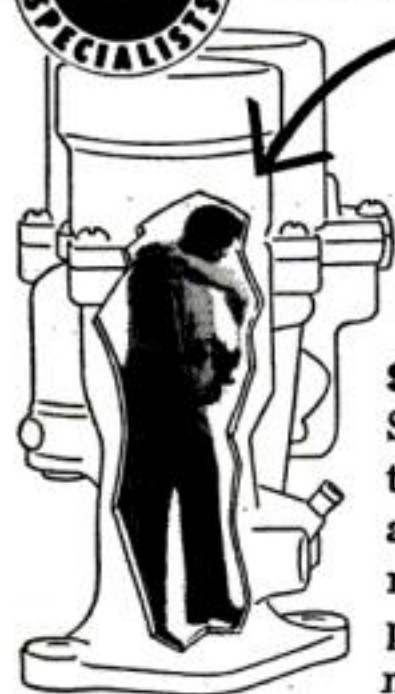
Address.....

City.....State.....

() Check here if Veteran of World War II



Save Gas!



**This Expert Knows
CARBURETORS
(ALL-MAKES)
'Inside Out'**

SEE HIM: The Hygrade System mechanic locates the trouble faster and does a more thorough job. He replaces all worn parts and parts that wear with brand new parts.

HYGRADE SYSTEM FOR PEAK PERFORMANCE CARBURETOR OVERHAULING • ALL MAKES

AutoMechanics

Become a recognized carburetor expert. Open a Hygrade System Carburetor Dept. Write HYGRADE, 37-18A Northern Blvd., L.I.C. 1, N.Y.

HYGRADE 37-18A Northern Blvd.

Long Island City 1, N. Y.

Send free booklet describing revolutionary Hygrade System of Carburetor Rebuilding

Name.....

Address.....

ATTACH TO YOUR LETTERHEAD OR BILLHEAD

SPARE TIME MEANS SPARE CASH with this welder in your home



**WELDS
CUTS
SOLDERS
BRAZES
CHARGES
BATTERIES**

"LINCWELDER 60"
New Lincoln Arc Welder

**Be the handyman welder
for your neighborhood**

Repair damaged car bodies and fenders... fix toys... braze and solder broken parts... recharge batteries... and do other profitable work. It's so easy now with the new Lincoln arc welder.

- Comes complete with full instructions.
- Approved by Underwriters Laboratories.
- Operates from 115 volt grounded circuit. (No. 12 wire fused for 20 amps.)

**ORDER
YOUR WELDER
NOW**

Fill out and
mail to
**THE LINCOLN
ELECTRIC
COMPANY**
Dept. 206
Cleveland
1, Ohio

- ☐ Ship me the "Lincwelder 60" with accessories \$48.00 (Including headshield, electrodes, carbons, electrode holder, ground clamp and cable). ☐ Arc Torch \$6.25 extra.
☐ Battery Charging Attachment \$10.00 extra.
Enclosed is ☐ check ☐ money order
☐ Send me free bulletin on the new "Lincwelder 60"

Name.....

Address.....

City..... State..... 206

Watchmakers WANTED!



Learn this high-pay trade. Copyrighted Sweazey System shows you how... quickly, successfully... at home or in our Chicago School (founded 1908). We furnish tools, supplies, practice watches for home study course. No previous experience needed. Try it without obligation!

FREE SAMPLE Home Study LESSON

Approved resident courses include chronograph repairing, jewelry repairing, gem setting, and jewelry engraving. Write for full information.

CHICAGO SCHOOL OF WATCHMAKING

1608 N. Milwaukee Ave., Dept. 4111, Chicago 47, Ill.



BOYS! MAKE YOUR OWN RADIO

Make your own simple, tubeless, batteryless Crystal Radio. SEND 25c for a GENUINE MELOMITE CRYSTAL with complete illustrated instructions for making your own set. Crystal sent postpaid with instructions and our own publication, "THE MAGIC CRYSTAL" which is full of news, diagrams, questions and answers of interest.

SEND 25c FOR YOUR CRYSTAL TODAY!

ALVA ALLEN RADIO Dept. 189 Clinton, Mo.



1,001 USES!

Turn the knob—read the voltage. Indicates whether AC or DC. On DC indicates polarity. Picks up 2 volt drop at 110 V. Measures from 65-660 V. Virtually burnout-proof. Guaranteed for 25,000 hours' use. Rugged! Throw it in with tools. 12" flexible test leads and prods. Not a gadget, but a proven tool. At your dealer's or postpaid. \$300

INDUSTRIAL DEVICES, INC., EDGEWATER 2, N. J.

Secrets of VENTRILOQUISM Now Revealed!



Easy to learn in 60 to 90 days with our Home Study Course. RESULTS GUARANTEED. Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearances! For Free Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c. FRED MAHER SCHOOL OF VENTRILOQUISM Box 36, Studio 11 Kensington Station Detroit 24, Michigan

Be a DETECTIVE

A CHALLENGE FROM WASHINGTON, D. C. Help Stop Crime! Train at home. Earn big money. Amazing training course from the NATION'S CAPITOL (center of law enforcement) by former U. S. GOVT. AGENT and NAVAL INTELLIGENCE Officer exposes actual methods used by Criminals. Write for FREE BOOK. State age.

INTERNATIONAL DETECTIVE TRAINING SCHOOL
1701 Monroe St., N.E. Dept. 2111 Washington 18, D. C.

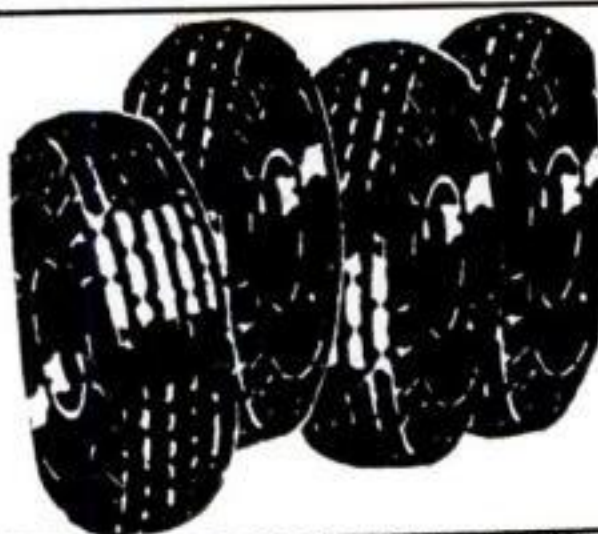


TEAR GAS

**A REAL SURE-FIRE SELLER!
THUGS AND THIEVES BEWARE!**

Here is a tear gas pencil gun which discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast. A safe and effective substitute for dangerous firearms. No permanent injury. Needed in Stores, Banks, Autos and Homes, everywhere to protect Life and Property. No skill required. Handle our tear gas as a side line and you'll soon give it full time. For a quick start send \$4.25 for complete demonstrator outfit consisting of an Automatic Pencil Gun with 10 demonstrators and 3 powerful Tear Gas cartridges fully guaranteed. Many thousands now in use. Order your outfit today. Not sold to minors.

Hagen Supply Corp. Dept. A511 St. Paul 4, Minn.



WRITTEN GUARANTEE SENT WITH EVERY TIRE YOU BUY

PLEASE NOTE: Our Tires are NOT Re-Treaded or Re-Capped

GOOD USED TIRES

A TRIAL OF ONE TIRE WILL CONVINCE YOU.

TUBE GIVEN WITH EACH PASSENGER & TRUCK TIRE AT NO EXTRA COST SEND THIS AD

If your size is not listed write for prices. 18 YEARS AT THIS ADDRESS.

600x16	\$5.12	670x15	\$6.12	710x15	\$6.12	760x16	\$7.72
650x15	5.52	700x15	5.92	750x16	6.52	820x15	6.72
650x16	5.52	700x16	5.42	760x15	5.92	550x17	5.22



600x20	\$9.52	32-6(8)	\$10.42	1000x20	\$18.02
650x20	9.52	32-6(10)	13.82	1100x20	18.42
700x20	11.62	825x20	17.92	1000x22	17.42
750x20	11.92	900x20	17.72	1100x22	18.02

No extra charge for tubes—Tube given with every pass. and truck tire purchased, regardless of grade

600x16	\$5.39	670x15	\$6.20	710x15	\$6.32	760x16	\$7.95
650x15	5.75	700x15	6.50	750x16	6.86	820x15	6.95
650x16	5.86	700x16	5.75	760x15	6.42	550x18	5.02

600x20	\$9.75	32x6(10)	\$14.02	1000x20	\$18.35
650x20	9.95	750x16(8)	8.95	1100x20	18.35
700x20	11.75	825x20	18.50	1000x22	17.35
750x20	12.75	900x20	18.50	1100x22	18.35

Thousands of tires shipped all over U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. 5.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

Block Out T.V. INTERFERENCE PIX FIX 2.95 \$3 P.P. ☐ \$3 enclosed ☐ Send C.O.D. Cut Out Ad! Mail Now!

Better reception. Immediately! PIX-FIX electronically blocks out interference-lines! Ghosts, Snow, Diathermy, Flickering. BEFORE they reach picture tube! 100% SAFE—USES NO VOLTAGE! All assembled, tested, ready to attach in 90 seconds (out-of-sight!) Excellent in fringe & poor reception areas!

ELECTRONIC DESIGNS, Inc. (Dept. PS-1)
28 SCHOOL STREET YONKERS, N. Y.

PERFECT T.V. PICTURES or MONEY BACK! ORDER NOW

HE-MAN VOICE!

STRENGTHEN your voice this tested scientific way. Yes—you may now be able to improve the POWER of your speaking and singing voice... in the privacy of your own room! Self-training lessons, mostly silent. No music required.

FREE BOOK Write TODAY for Eugene Feuchtinger's great booklet "How to Develop a Successful Voice." It's absolutely FREE! You must state your age. Booklet mailed postpaid in plain wrapper. No salesman will call. Send your name and age **RIGHT NOW!** Perfect Voice Institute, 210 S. Clinton St., Studio L-1, Chicago 6, Ill.

Beauty in 3rd Dimension

A selection of figure studies in breathtaking 3rd Dimension. These pictures come to life when viewed through the magic viewer. Realistic depth and beauty only 3rd Dimension can provide.

Send 25c for Magic Viewer & Samples

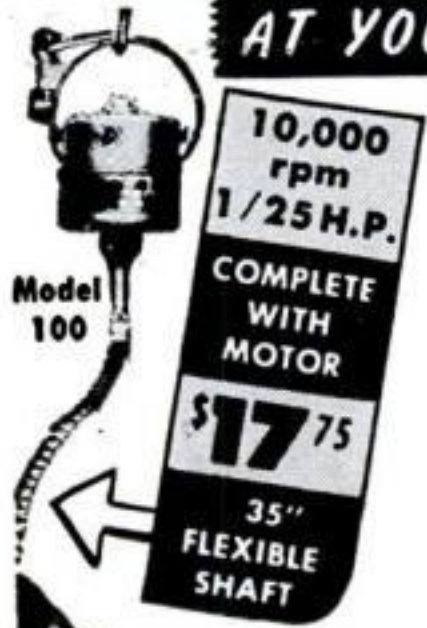
FREE LISTS

LOU TAGER
141 N. La Brea Ave., Los Angeles 36, Calif.

Dept. US-8

Foredom FLEXIBLE SHAFT MACHINES

PROVIDE DELICATELY CONTROLLED POWER AT YOUR FINGERTIPS!



THE PREFERRED SMALL POWER GRINDER among SKILLED CRAFTSMEN and AMATEURS ALIKE because NO OTHER TOOL PROVIDES COMPARABLE ALL-AROUND UTILITY and VERSATILITY!

HUNDREDS OF USES. YOU CAN grind, polish, drill, saw, sand, carve, mill, clean, rout, etch, engrave, etc. on all metals, wood, plastics, glass and linoleum. Use hundreds of accessories.

MORE POWER, LONGER MOTOR LIFE, because motor is not dwarfed to fit hand.

MORE USES because small-as-a-pencil, feather-weight handpiece gets to spots other tools can't reach. You'll find it the handiest tool you ever owned.

MORE SKILL, MORE DOWN-RIGHT SATISFACTION, because you get wonderfully smooth, effort-less performance and positive, accurate, sensitive control of your work—finger tip control. Lacking bulk, pencil-thin handpiece does not obscure your work as with conventional type grinders.

QUALITY-PROVEN for more than a quarter century. Precision-made by experts. Not built down to a price.

NOW AVAILABLE ALSO A HEAVIER-DUTY FOREDOM for EXTRA POWER and SPEED

Possesses Refinements Not To Be Found In Tools Priced Much Higher.



ONLY \$29.60 including 6-STEP FOOT RHEOSTAT

3 Way Useability • Hang it up. • Set on bench. • Mount under bench.

For industrial users and homecraftsmen who demand industrial quality. Extra long flexible shaft with tough, long-lasting Neoprene-covered sheath. Superior type handpiece with quick-detachable feature. Excellent for internal carving of plastics.

Your choice of 3/32" or 1/8" collets with either of models illustrated. Add 85c if you want both.

SENSATIONALLY LOW PRICED DURING THIS LIMITED TIME OFFER!

MORE THAN 100,000 FOREDOMS IN USE

IF YOUR DEALER CANNOT SUPPLY YOU MAIL COUPON FOR 10-DAY FREE TRIAL!

FOREDOM ELECTRIC CO., Dept. 1048-E DON'T DELAY ACT NOW!
27 Park Place, New York 7, New York

I must be delighted in every way or I can return my purchase within 10 days for full refund.

Please send me the following checked below:

☐ Model #100 @ \$17.75 ☐ 6-STEP FOOT RHEOSTAT for Model #100 @ \$5.25

☐ Model #9050 @ \$29.60 ☐ FREE CATALOG

☐ Send C.O.D. plus postage. I will pay postman

☐ Enclosed is cash or money order. Send postpaid

Name.....

Address.....

City & Zone..... State.....

9 BIG BUILDING BOOKS



12th Edition for
EXAMINATION
SEND NO MONEY

Learn to draw plans, estimate, be a live-wire builder, do remodeling, contracting. These 9 practical, profusely illustrated books cover subjects that will help you to get more work and make more money. Masonry, concrete forms, carpentry, steel square, roof framing, construction, plumbing, heating, painting, decorating and many other subjects. More than 4000 pages—2750 illustrations.

BETTER JOBS—BETTER PAY UP-TO-DATE EDITION

A nationwide building boom is in full swing and trained men are needed. Big opportunities are always open for MEN WHO KNOW HOW. These books supply quick, easily understood training and handy, permanent reference information that helps solve building problems.

These books are the most up-to-date and complete we have ever published on these many subjects.

Coupon Brings Nine Big Books For Examination

AMERICAN TECHNICAL SOCIETY — Publishers since 1899
Dept. G820 Drexel at 58th Street Chicago 37, Ill.

You may ship me the Up-to-Date edition of your nine big books, "Building, Estimating and Contracting," without any obligation to buy. I will pay the delivery charges only, and if fully satisfied in ten days, I will send you \$3.00, and after that only \$4.00 a month, until the total price of only \$34.80 is paid. I am not obligated in any way unless I keep the books.

Name.....

Address.....

City.....State.....

Please attach a letter stating your age, occupation, employer's name and address, and name and address of at least one business man as a reference. Men in service, also please give home address.

The Steady Pay Profession Good Times or Bad!

SCIENTIFIC CRIME DETECTION



FREE! OVER 800

"BLUE BOOK OF CRIME"

This book is full of exciting information on scientific crime detection. It will show how you can get started in a grand career. Now, at amazingly low cost. Clip coupon Now...Mail it today.

It Is Easy to Learn!

I will teach you this fascinating science during your spare time at home. It pays to be an expert in Finger Printing, Firearms Identification, Police Photography and Criminal Investigation. I have trained hundreds of men and women now successfully serving in identification bureaus throughout America. You, too, may quickly prepare yourself to become a well-paid valued officer of the law, often sharing in the generous rewards offered for wanted criminals.

of all Identification Bureaus in the U. S. employ students and graduates of I. A. S. A majority of these men are heads of Bureaus. Many of them knew nothing about crime detection before training with me. Now they have steady jobs, good salaries and a fine future. Write today for full particulars and free book. Give age. No salesman will call.

INSTITUTE OF APPLIED SCIENCE

(A Correspondence School since 1916)

1920 Sunnyside Ave., Dept. 1368, Chicago 40, Ill.

INSTITUTE OF APPLIED SCIENCE

1920 Sunnyside Ave., Dept. 1368, Chicago 40

Gentlemen: Without any obligation on my part, send me the "Blue Book of Crime," and complete list of Identification Bureaus employing your students or graduates, together with your low prices and Easy Terms Offer. (Literature will be sent ONLY to persons stating their age.)

Name.....Age.....

Address.....R. F. D.....

City.....State.....

Auto Spark Intensifier Gets ROCKET Performance



- ✓ More Power
- ✓ More Speed
- ✓ Better Mileage
- ✓ Quicker Starting

The ELECTRONIC SPARK INTENSIFIER is an efficient, scientifically developed automotive device which can be easily installed in the center hole of the distributor cap of all autos, trucks and tractors in sixty seconds. By boosting the high voltage current passing through the distributor, it gives a "hotter spark" permitting a wider spark gap . . . thus reducing "misfiring," ring and cylinder wear and allowing all-around better performance. **FREE TRIAL**, send \$2.00 cash, check or money order . . . if not fully satisfied after 10 day trial, return for immediate refund.

ELECTRONIC DEVELOPMENT CO., Box 17716, Dept. P5-11, Los Angeles 34, Calif.

Don't Neglect Slipping FALSE TEETH

Do false teeth drop, slip or wobble when you talk, eat, laugh or sneeze? Don't be annoyed and embarrassed by such handicaps, **FASTEETH**, an **alkaline** (non-acid) powder to sprinkle on your plates, keeps false teeth more firmly set. Gives confident feeling of security and added comfort. No gummy, gooey, pasty taste or feeling. Get **FASTEETH** today at any drug store.

EASY TO LEARN CODE

Learn or increase speed with an Instructograph—the Radio-Telegraph Code Teacher that takes the place of an operator-instructor and enables anyone to master code without further assistance. Available tapes from beginners alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready—no QRM. Thousands have "acquired the code" with the Instructograph System. Write today for convenient rental and purchase plans.



INSTRUCTOGRAPH COMPANY
4701-P Sheridan Road, Chicago 40, Illinois



12 Months Driving for \$4.95

A new tire guarantee with each used tire. Positively Not Re-Caps—Every Tire Machine Inspected

600-16 \$4.95	Two for \$9.50	650-16 \$5.50
670-15 \$5.95		700-15 \$5.95

Send this ad with order. Mail orders rushed on receipt of check or money order for the size desired.

Dept. A
West Park Tire Sales, 14018 Beech Ave., Cleveland, O.

FLORIDA

OPPORTUNITY BULLETIN

• The Florida Opportunity Bulletin is an exciting new publication, issued on the 1st & 15th each month and listing hundreds of job openings, business opportunities, farms, groves, city lots, homes, etc. All important areas of the "Sunshine" State covered—Jacksonville, Tampa, Miami. Detailed reports in each issue on employment, trade, real estate. New business & industries are reported, giving names, locations, etc. No other publication like it. Of vital importance in helping you find the right job . . . buy the right business, farm, grove or home. Let the BULLETIN be your gateway to opportunity, health & happiness. Send only \$1.00 cash, check or money order today for trial subscription next 5 big issues.

FLORIDA OPPORTUNITY BULLETIN
Box 539-PS, MIAMI BEACH, FLA.

**Trial
Subscription**
5 Issues \$1.00

Satisfaction guaranteed. If not delighted on receipt of first issue your \$1 will be promptly refunded. Act now!

"I made \$800
in 3 months
while still
taking your
course"-F.V.
NEW YORK



NOW! LEARN THE VITAL ELECTRIC EQUIPMENT and APPLIANCE SERVICE and Repair Business!

"I made \$14 per
day while still
learning"-T.E.H
WEST VIRGINIA



BIG MONEY—INDEPENDENCE

Here is the ideal business for the man who is happiest when working with tools. Wide open opportunities in every city, town, village. Everyone a customer for the man trained to service and repair electrical equipment and appliances.

NO PREVIOUS EXPERIENCE NEEDED

New visual method of instruction teaches you how to repair electric motors, house wiring, refrigerators, auto ignitions, automatic washers, garbage disposals, fluorescent lights, irons, cleaners, etc. NO PREVIOUS EXPERIENCE NEEDED. Almost before you know it you will have the knowledge to help you make BIG, EASY PROFITS at home in this highly respected and growing field.

yours!
Big Kit Tools
Does not cost you
one cent extra.

AGE NO HANDICAP

Young men, older men, even the man of 69, can find a place in this expanding big-money field. Grasp this opportunity for better things today.

PACIFIC TRAINING SCHOOL

Dept. S-5111 7217 So. Broadway • Los Angeles 3, Calif

Your Own Business—Spare or Full Time

Your own business—your own shop. Complete step-by-step instructions include our book, "HOW TO OPEN YOUR OWN BUSINESS." Costs nothing extra. PTS training more than a home-study course—gives you the "know-how"—all the professional secrets of electrical equipment and appliance repair and service—the operation of your own shop from a business standpoint—what to charge—how to bring your customers to you—everything to start you on the road to success and future security. I'll send you my complete plan that shows you how to learn the electrical equipment and appliance service business.

SEND NO MONEY—WRITE TODAY!



FREE!

Book that tells you how to learn to repair and service electrical equipment and appliances.

MAIL COUPON NOW

PACIFIC TRAINING SCHOOL, Dept. S-5111

7217 S. Broadway, L.A. 3, Calif

Send me your FREE book that tells me what electrical appliance repair and service can mean to me. Remember I am under no obligation.

Name _____

Address _____

City _____ Zone _____ State _____

Amazing Attachment MAKES OLD REFRIGERATORS INTO MODERN Automatic Defrosters!

Thirty Million Prospects. Sell without "selling pressure" on sensational Free Trial Plan. Just plug it in and leave it. Frees women from drudgery and mess of defrosting. Saves electricity. Keeps food longer, better. Gives longer life to refrigerator. Secret "follow-up" Plan often brings five additional sales by making every user your agent. Big season now on!

SENT FREE... JUST SEND NAME!

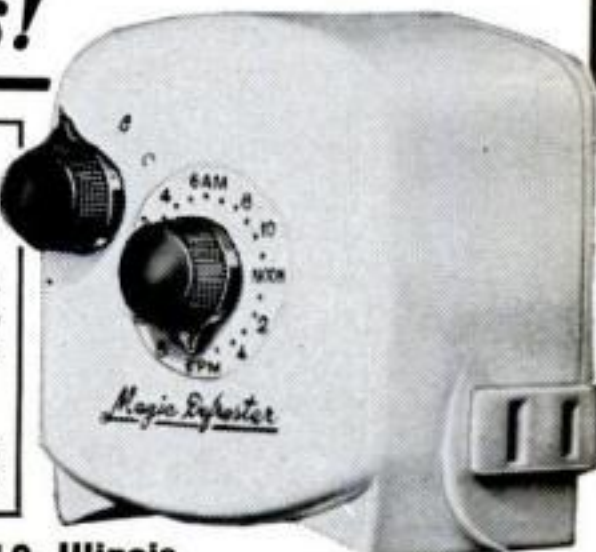
Don't send a cent—just your name on penny postcard. We'll send you the biggest money-maker you ever got your hands on and guarantee your sales at profits as high as \$5.00 on each sale. Rush your name!

MAXILUME COMPANY, 125 West Hubbard Street, Dept. D-911, Chicago 10, Illinois

**Women
buying by the
thousands!**

Salesmen Clean-
ing up on "Free
Trial" Sales Plan
Sent Free with
Instructions.

Make as high as
\$5 on Every Sale!



EXAMINE FIRST... FREE! FASCINATING NEW PROFIT PLAN

I'LL SEND YOU EVERYTHING TO
EXAMINE IN YOUR OWN HOME,
LOOK IT OVER—THEN DECIDE!

NELS IRWIN

PAINT
WITH
SUEDE
COVERS
ANY SURFACE



AUTOTRUNK
INTERIORS
RADIO'S
AUTO DASHBOARD



PHONOGRAPH
TURNABLES



JEWELRY
BOXES
LAMP'S

SHOES



Tired of — monotonous, low-pay jobs — of working for the other fellow? Tap rich profits in huge NEW field. Have your own lifetime business — earn REAL money — say goodbye

forever to time clocks—bosses! Become part of tremendous expanding industry — have your own business, spare or full time. No big investment, no long leases, operate at home.

**PROFIT
UP TO
\$500
PER HOUR**

BIG DEMAND FOR NEW MIRACLE FINISH

We show you every step. Filling huge year-round-demand. easy to understand instructions tell you how. Earn up to \$5 an hour spare—full time. A few cents' worth of materials — brings you dollars! Here is the opportunity you have been waiting for!

GRASP THIS OPPORTUNITY TODAY. It's too good to miss. Fill out coupon, mail today. Get FREE sample, FREE plan, big IDEA booklet. No salesman will call! Do it NOW — be first in your community to cash in on this huge new market!

LEARN IN A FEW DAYS THROUGH PROVED, TESTED METHODS to start earning more money with this amazing MIRACLE finish—gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dashboards — hundreds of items. FREE PROFIT PLAN offers everything you need to start at once. Fill out coupon, mail today. Do it NOW! Be first in your area!

USE COUPON FOR FREE SAMPLE-PROFIT PLAN

COAST INDUSTRIES Dept. 1B

1004 S. Los Angeles St., Los Angeles 15, Calif.

Gentlemen: Please rush me your FREE Profit Plan.

NAME _____

STREET _____

CITY _____ STATE _____

**FLOK
KRAFT**

SEND NO
MONEY
Get Facts
FREE!

COAST INDUSTRIES Dept. 1B 1004 S. Los Angeles St., Los Angeles 15, Calif.

HOW TO FIX TV!



COVERS EVERY TV JOB

Setting Up The Receiver • Antenna Installation • Test-Pattern and Picture Analysis • Tube Installation Adjustment • Circuit Trouble • Sight and Sound Synchronization • Tuning, Scanning, and "Poor Picture" Cures • Control Adjustments • High-Voltage Power Supplies • Interference Remedies • Video Amplification and DC Restoration • and MUCH MORE.

Same FREE EXAMINATION Offer on Essentials of RADIO

806-p. encyclopedia of radio principles. "Starts from scratch," amazingly complete. Just check box in coupon.

Start Cashing in on Huge TV Boom! Get Complete "Course" in Installation, Service, Adjustment, Repair— All in ONE New Book!

PREPARE now for the big-pay jobs or your own business in the TV field. Learn television servicing quickly AT HOME... IN SPARE TIME... with this brand-new "Television Servicing" manual. Almost 500 Pages—300 Pictures, Diagrams, Charts guide you by unique step-by-step method—in locating the receiver, antenna installation, all major adjustments and repairs, etc. How the video AM and FM signals originate... how each is transmitted and received. How to service each circuit block of receiver; localize reception troubles; diagnose interference and breakdowns; trouble-shoot AFC Circuit; service Cathode-Ray tubes, etc. How to "lick" ANY job quickly and expertly. Makes it easy for radio servicemen to branch out in TV.

FREE 10-DAY EXAMINATION—Send no money. Mail coupon below to examine "Television Servicing" FREE—without obligation.

McGRAW-HILL BOOK CO., Inc., Dept. PS-11-51
327 West 41st St., New York 18, N.Y.

Send for 10-day FREE examination:

☐ **Television Servicing** (Heller). If not satisfied, I'll return it, pay nothing. Or I'll keep it, send only \$2 (plus shipping), then \$2 per mo. for 2 months. (We will pay postage if you enclose full pay't. NOW. Books and full pay't. returnable.)

☐ **Essentials of Radio** (Slurzberg). If not satisfied, I'll return it, pay nothing. Or I'll keep it, send only \$2 (plus shipping), then \$2.25 per mo. for 2 months. (We will pay postage if you enclose full pay't. NOW. Books and full pay't. returnable.)

Name.....
Address.....
City.....State.....
PS-11-51

FREE! 10 HITLER STAMPS!



10 SCARCE STAMPS—ALL DIFFERENT—SENT FREE TO SECURE NAMES FOR OUR MAILING LIST

MAIL coupon at once. We'll send you this fascinating set of 10 Hitler stamps. Different sizes, colors, values. NO COST TO YOU. Stamps were issued by short-lived nation of Bohemia-Moravia. Much sought after. Now becoming SCARCE. Our supply is limited. Don't ask for more than one set. We'll also include other interesting offers for your inspection—PLUS a FREE copy of our helpful, informative book, "How to Collect Stamps."

This special offer may have to be withdrawn soon—so rush coupon with 10c to help cover postage, handling NOW to: **Littleton Stamp Co., Dept. PS-11A, Littleton, N. H.**

Copyright 1951, L. S. Co.

LITTLETON STAMP CO.
Dept. PS-11A, Littleton, N. H.

Send me FREE the ten Hitler stamps and informative booklet, "How To Collect Stamps." I enclose 10c to cover postage, handling.

Name.....
Address.....
City.....State.....

If You Own a Schick or Remington Electric Razor...

You get a closer shave and greater comfort by preparing your face before you shave. In just three seconds this wonderful lotion "sets up" your face for shaving.

1. It evaporates sticky, razor-clogging perspiration.
2. It lubricates the skin for faster, more comfortable shaving.
3. It tautens your skin—"brings out" beard for closer shaves.

It also lubricates shaver's cutting head for easier action, longer shaver life!



That's Lectric Shave. Only 49¢, plus tax, for 3 oz.—80 shaves. Use with any make shaver. For a free month's supply send name, address to **The J. B. Williams Co., (PS-8), Glastonbury, Conn.**



Find HIDDEN TREASURES

GEIGER COUNTERS for Uranium Detection (see at left). **TREASURE DETECTORS** for gold, silver, etc. Lightweight, ultra sensitive. None finer at ANY PRICE. **INFORMATION FREE.**

Detection Co.
5631 Cahuenga, No. Hollywood, Calif.

BOYS-IT'S FREE!

"THE WONDERS OF CHEMISTRY"

This exciting new book shows how to amaze your friends with chemical magic, describes many fascinating home experiments, tells of fun, thrills and big future opportunities for boys who know chemistry. Special atomic energy feature. Send today!

THE PORTER CHEMICAL COMPANY
136 Prospect Avenue Hagerstown, Maryland



JEWELER'S SCREW DRIVERS

8 Jeweler's Screw Drivers. A must for every hobbyist and model builder.



Ideal for precision work, camera and fine instrument repairs. In 8 sizes—from the smallest size 9 up to size 2. Finest tempered steel blades. Lowest price! **MONEY BACK GUARANTEE IF NOT SATISFIED** C.O.D. \$2 plus postage, or send \$2 and we pay postage.

PINE WATCH CO. DEPT. 40, N. Y. 2, N. Y.

THE
IDEAL
X-MAS
GIFT!

ITALIAN ACCORDIONS



All types, all models, Very best. Hand Made. Fully guaranteed. Buy direct from Factory representative at lowest wholesale prices, and Save Money. Also Button Accordions, Chromatic Accordions and Concertinas. We take any instruments in trade. Send name and Address for FREE catalog.

ITALIAN ACCORDION MFG. CO.

7600 Cottage Grove Ave., Dept. PS-11, Chicago 19



START A BUSINESS MAKING

Concrete Blocks

New superior method makes square, true, easy-to-lay, modern blocks. Will pass building code. High production, big profits. One \$30 machine will make four 5"x8"x12" blocks per minute—1000 per day. Can pay for itself in a day. Sell blocks, or save 2% building cost by making and laying your own. Money back Guarantee. Send Postcard for Free Catalog.

Economy Manufacturing Company
DEPT. S. STONE MOUNTAIN, GEORGIA

THE POPULAR SCIENCE



Christmas

GIFT MART

*Get down your suggestions on this
Popular Science Family Memo:*

This year simplify your Christmas shopping and make sure you get the gifts you want.

Check the following pages of the Christmas Gift Mart carefully for gift ideas. Get down those you want for **YOURSELF**. And since there are suggestions for everyone, list the presents for the whole family on the handy Memo on this page. If you're in doubt, let the others in the family browse through the Gift Mart and get down the gifts **THEY** want themselves.

These well-placed hints will cut out your shopping headaches and insure a truly Merry Christmas for you this year.



make your **HANDS** **MORE CREATIVE** with **X-acto Knives and Tools**

Creative hands can be your greatest asset... X-acto knives and tools help the intelligent coordination of active minds and agile fingers... they can develop skill and dexterity in any art or handicraft you select.



Whether it's boat whittling, model airplanes, wood-carving, leathercraft, model railroads or any other handicraft, you can make your hands more creative with "designed-for-the-job" precision-engineered X-acto knives, tools and handicraft kits.



X-acto offers the complete line of handicraft knives, interchangeable blades, tools and attractive kits.



From 25¢ to \$30.—at dealers everywhere.



No. 82
X-ACTO KNIFE CHEST
\$4.20



Send 15¢ to cover postage
for our new illustrated
28-page Catalog.



X-acto Crescent Products Co., Inc.
440 Fourth Avenue, New York 16, New York

SAVE 85% in WAR SURPLUS **FAMOUS GSAP** **16MM** **CAMERA**

That famous "gun camera" used by the Navy & USAF. Now adapted to hand use for making professional or amateur movies. Takes pictures in B&W or full Color. Has 1-3/8" lens, built-in exposure guide and shade. Adjustable for 3 SHUTTER SPEEDS - 16, 32 & 64 frames per second. Uses regular Eastman magazines (50 ft). Requires no winding - no film threading. Comes complete with "ZOOM" Range-finder & Battery Box. Operates on 24 volt current supplied ordinary flashlight batteries. **READY TO USE!** (Needs only film & batteries).



44.95

150 POWER ALL PURPOSE **COMBINATION** **MICROSCOPE**

A TRIPLE PURPOSE INSTRUMENT. Small and compact yet Powerful! Has a tilting stand with mirror reflector and slide stage for USE IN THE LABORATORY... Will magnify surface views up to 150 POWER when separated from stand to USE AS A POCKET MICROSCOPE... Has an attachment to hold slide directly in the instrument for using as FIELD MICROSCOPE. COMPLETE WITH SLIDES & LEATHER CASE.



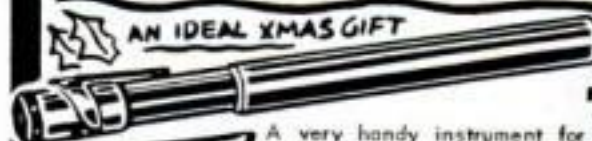
79.95

WATCHMAKER'S **LOUPE**

An indispensable aid to the Jeweler, Scientist, Watchmaker, Instrument Repairman, Lab Technician, Machinist, etc. Available in several powers. 2-1/2 - 2-3/4 - 3-1/4 - 4 and 5 Power. EACH—

79¢

AN IDEAL XMAS GIFT



1000 VALUE
\$4.95

8 POWER **COATED LENS** **TELESCOPE**

A very handy instrument for spotting distant objects. Small as a pocket pen yet has full 8 POWER magnification. Has expertly ground, precision polished lenses. Body is made of fine grade, polished metal with pocket clip. Easy focusing. 8 1/4" expansion. A \$10.00 Value.

SWISS **PATTERNED** **NEEDLE** **FILES**

The ideal set for the model maker, technician, repairman, etc. Made of the finest quality, Sheffield Steel, specially hardened and accurately machined for precision filing. Set of 12 ass't shapes - A \$5.00 Value -

2.95

SET OF 12



LUND TRAILWAY **SNOW SHOES**

Genuine LUND Snow Shoes. Size of frame is 10" by 52". The one-piece, special hardwood frames are laced with good quality, water-proof, thongs. Designed for faster, easier travel. 7 Ft. G.I. SKIS with metal edges. . \$13.50

2250 VALUE
14.95

SKI POLES

Natural cane or laminated steel pole with leather laced snow ring. Pole is metal tipped. Has wrist straps. Length is 4 feet. Ideal for use with skis or snow shoes. A Palley Value at

Only 3.95

NEW! SKI PATROL **GENUINE ARMY PARKAS**



Made of heavy White Duck. Wind and water resistant. Slip-over type with draw strings on each cuff and around waist and hood. Neck has four tie-straps for adjustment. Body is finger-tip length with 2 large outer pockets. Ideal weather protection for the outdoor sportsman, hunter, farmer, rancher, etc. A BUY!

24.95

NEW GOGGLES



Soft, molded rubber frames, chamois lined. Comes with 8 lenses, 2 clear, 2 amber and 4 Green. All lenses are easily and quickly inter-changeable. COMPLETE

3.95

PALLEY
SUPPLY CO.

DEPT. P.S.11
6321 SAN FERNANDO RD
GLENDALE 1, CALIF.

SEE AD ON
OPPOSITE
PAGE FOR
TERMS!

FOAM RUBBER



In Slabs, Sheet stock & moulded, pre-formed Cushions, Mattresses & Pads. Use it for upholstering, beds, pillows, nooks, chairs, sofas, patio & yard furniture, auto seats, boat deck pads, etc. Priced FAR BELOW current market!

CORED STOCK - Smooth one side, "cored" on other side to give max. resilience & reduce weight. Ideal for chairs, cots, beds, bunks, thick - per sq. ft. thick - per sq. ft.

1"80	3"	\$1.70
1 1/2"	1.10	4"	3.00
2"	1.50	4 1/2"	3.14

SLAB STOCK - Smooth both sides. A solid but spongy material. Use for pads or shock-absorbing layer pads.

thick	per sq. ft.
1/4"	\$1.25
1/2"50
3/8"38
1/4"75
1"	1.00

Palleys will cut the Slab or Cored Sheet stock to your needs. However all pieces must be rectangular or square in shape at least 1 square foot or larger.

TOPPER PADS
40" x 25" x 1 1/4" \$7.95 || 25" x 40" x 1 1/4" | \$8.95 |
| 25" x 65" x 2" | \$9.95 |

SEAT PADS
22" x 18" x 3" \$5.00 || 22" x 20" x 3" | \$5.00 |
| 13 1/2" x 18" x 4" | \$10.75 |
| 20" x 20" x 5" | \$6.00 |

17 Power Telescope

A fine quality, IMPORTED instrument. Gives a bright, clear image with a wide field of view. An ideal telescope for all-around use. **ONLY 7.95**

20 inch TANK TELESCOPES
3 Power..\$4.95--20 Power..\$8.95

EXACTOR HYDRAULIC REMOTE CONTROL

MASTER & SLAVE
Consists of two units. Designed to operate controls on boats, machinery, engines, motors, etc. without need for rods, cables, pulleys, etc.

When connected with 1/2" tubing & filled with oil they act as a precision, remote controller. When Master handle is moved, Slave arm responds in exact motion. Range is 0 to 90 degrees. **42.50**
Combination Master & Slave for **MASTER Only** - For an extra control on bridge or stern. **21.25**

MICROPHONE

Telephone type, highly sensitive with excellent clear tone. This was the Signal Corps favorite. An ideal instrument for the radio "ham" and professional recording studio, broadcasting, home recording, public address, etc. A sensational buy! Complete with cord and plug. **3.29**

SAVE 85% IN WAR SURPLUS

NEW ILLUSTRATED 200 PAGE CATALOG
1000's of MONEY SAVING BARGAINS for the Mechanic, Housewife, Manufacturer, Hobbyist, etc. Clothing, Tools, Machinery, Metals, Electrical Supplies, Motors, Rubber, Plastics, Hydraulic supplies (cylinders, pumps, motors, valves, fittings, hose, etc.). **SEND ONLY 25¢** to cover mailing & handling

PALLEY SUPPLY CO
6321 SAN FERNANDO RD.
Deer PS-11 GLENDALE 1, CALIF.

SAVE UP TO 85% IN WAR SURPLUS GADGETEERS HEAVEN

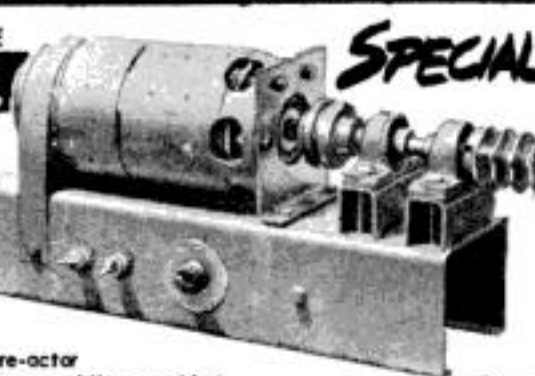
PORTABLE GEIGER COUNTER RELIABLE

A SUPER-SENSITIVE, RADIO-ACTIVITY DETECTOR! Small enough to fit into a pocket or the palm of your hand, yet powerful enough to detect the slightest presence of radioactive matter. Now anyone can get in on the search for valuable mineral deposits with the prospect of RICH REWARD! An ideal instrument for use in PROSPECTING, CIVILIAN DEFENSE, LABORATORIES or SCHOOLS. You'll marvel at its reliability under any conditions - you'll appreciate its clear, audible "click". Size: 1 1/2" x 3" x 5". Weighs only 1 1/4 lbs. Fully guaranteed. Complete, with headset and ready to use. **24.95**



STATIONARY or PORTABLE D.C. ARC WELDER

300 AMPS CONTINUOUS 350-400 AMPS INTERMITTANT
For light or heavy duty work. Will easily handle welding up to 1/2" plate. Made to operate continuously, giving years of trouble-free service. Built around that famous B-29 (R-1) generator incorporating many features no other generator has. Unit includes pulley re-actor output controls, Hi-lo switches & rheostat. All assembled on heavy steel frame and easily adapted to mounting on Jeep or Tractor for portability & power supply. Can be run on 7 1/2 HP electric or 10 HP gas motor. Generator alone cost Gov't \$400! **NOW ONLY 97.50**



NAVY Sealed Beam LAMP

U. S. Navy Portable search-spot light. Has pistol grip and aiming sight. Makes an ideal Search, Spot or Emergency light for Auto, Boat etc.

12V. light - 4" lens **3.29**
24V. light - 5" lens **3.79**

Set of 3 filters - red, green, amber. (specify type lamp) **99¢**

NAVIGATORS LAMP

A handy light for desk, work bench... chart table... engine room, etc. Can be used on 6-12-24-110 Volt by changing bulb. 3 ft. shaft has 4 joints to adjust position. **3.29**

TACHOMETER

Operates on direct drive with a flex shaft from camshaft or at 2 to 1 reduction from crankshaft. Range is 0 to 4500 rpm. Ideal for planes, boats, autos, etc. **4.75**

HUNTING KNIVES

GENUINE G.I.
equipment. Has a 6 inch, polished Vanadium blade & handle made of leather and fibre discs. Comes complete with tanned leather sheath. **ONLY 1.98**

HUNTING & FISHING KNIFE SET

Consists of 2 KNIVES. Hunting knife has 4" sabre grnd blade & Fishing knife has 3" blade. Simulated pearl hdl. **5.95**

Hunting & Field BOOTS

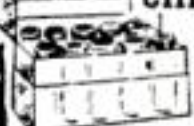
Has 14", sturdy, leather uppers & genuine, all-rubber shoe with felt inner sole. Designed to wear over ordinary shoes & protect feet from water, ice & snow. An excellent all-weather boot. **3.95**

HAND LINE

Rat-proof, weather resistant, hard linen line. Originally used as hand line in fishing for tuna, marlin, etc. Also has many uses around farm, factory and outdoors. **NEW in 300 ft lengths 1.69**

CHEMISTRY SET

Made for Chemical Warfare Division for testing, water, etc. A handy addition to the chemistry lab, or an exciting experiment for the amateur. Set includes test tubes, complete instructions, 15 different items. Packed in attractive lucite box with cover and dividers. **1.89**



FULL YEAR GUARANTEED

WATCHES

Here's a real shock absorbing watch. Has jewel movement, sweep second hand, luminous dial, chrome case. An ideal watch for children or adults. Fully guaranteed. **6.95**

17 JEWEL CHRONOGRAPH

One of the finest made anywhere. Sweep second hand, stop and re-set button. Measures airspeed, groundspeed, races, etc. Ideal watch for the sportsman. **26.95**

17 JEWEL AUTOMATIC

A fine, self-winding watch for men. Winds itself as you wear it. Has genuine Incabloc (shock protected) movement. In choice of Silver White or Black face. Water-proof case with stainless steel back. Has full sweep second hand. Comes with genuine leather strap. Factory guaranteed for one year. (plus 10% Federal Tax) **26.95**

7 x 35 BINOCULARS

The Very POPULAR CENTER FOCUS Model with Coated, Achromatic Lenses. Combines higher resolving power with extreme image brightness and amazing clarity. An IDEAL GLASS FOR ALL AROUND USE DAY or NIGHT! Has Lightweight, Precision made, Aluminum housing. Field of view is approx., 375 feet at 1000 yds. Complete with Leather Carrying Case and Neck Straps. **47.95** (plus Fed. Tax)

7 X 50 PRISM BINOCULARS

Big, Powerful Lenses give maximum image brightness & needle-sharp vision. Individual eye focus, Wide field of view. **33.95** (plus Fed. Tax)

FLYING SUIT or Blue Bunny SUIT

For hunting, winter sports, skiing or "bundling". As coveralls for cold outdoor, or farm work, 100% woven wool with extra flannel inner lining for double warmth & utility. Wiring so fine, flexible it does not interfere with movement. Can be used with or without heating or can be plugged into car, tractor, or truck battery. Sizes 36 thru 44. **7.95**



A.F. FLEECE LINED JACKETS

Will keep you warm and comfortable in the roughest weather. Has fleece lining throughout sleeves and body. Two roomy, slash pockets & full zipper front closure. Really an ideal jacket for all Outdoorsmen, Hunters, Farmers, Mechanics, Ranchers, **14.95**

RE-CONDITIONED and in WONDERFUL CONDITION.

B-15 JACKET

That 'HOT' JACKET you will be proud to wear! Water repellent, wind resistant, Nile Green, Oxford Cloth. Full, sturdy, zippered front. 100% Alpaca Wool lining in body and sleeves. Has a large Mouton Fur collar and 2 roomy, slash pockets. Ribbed cuffs. Size 36 to 46. **15.95**

A PALLEY SPECIAL

FLYING HELMET

Fine grade leather. Chamois lined with chin cup on strap. Intermediate weight. **NEW ONLY 1.59**

All New! Winter type with fleece or chamois lining. Has ear puffs & chin cup. Ideal for pilots, cycle - drivers, sportsmen, etc. **1.95**

Aviators (AN-6530) Windproof & Dustproof GENUINE GOGGLES

Rubber or chamois covered frame. Clear or Green GROUND LENSES are inter-changeable. Adjustable nose bar. Ideal for flying, motor cycling, etc. **2.19**

GO-1 GOGGLE KIT

NEW! U.S. Navy - Has soft sponge rubber frame. 4 Polaroid lenses 2 green, 1 red, 1 clear. Perfect for racing, cycling, etc. **89¢**

SILK PARACHUTE, CAR COVER- 24 ft

in diameter (approx. 50 sq. ft.) Enough to cover any car or small truck. Heavy, double stitched seams. **16.95**

16 POCKET VEST

The ideal jacket for the Rifleman or Hunter. Has 14 individual, outside pockets for shells, glasses & other accessories. 2 large (11" x 8") inner pockets for maps, food, etc. and a leather holder for knife, gun or tool. Sturdy yet lightweight with tie-straps at back for adj fit. Don't Miss This One at **3.49**

T.V. ANTENNA

Tune in on this amazing offer. A complete "V" Cone, Antenna Kit containing a 6 ft mast, 60 feet of lead-in wire, 25 ft of guy wire, 3 roof hooks and 3 brackets. \$13.50 Value. **SPECIAL 8.95**

Navy WADING SUIT

Adds real pleasure to surf and deep stream fishing! Made of rubberized canvas with vulcanized seams. Has inner air pockets to give buoyancy and balance in deep water. Finest quality, rubber gloves & 1/2 length boots are attached to sleeves and pants legs. Sizes are: Small, Med., Large **6.95**

Order from this ad. All sales final. Prices F.O.B. Glendale. Pay by M.O. or check. P.O.'s accepted from D&B firms. No deposit with C.O.D.'s.

LARGEST FIRM OF ITS TYPE IN THE WORLD

William Holden

Co-Starring in
"SUBMARINE COMMAND"
A Paramount Picture



"The handsome Jewel box Packing is a delight to the eye".



"Every automobile should have a 'Mile-O-Meter'".

is a "MILE-O-METER" Driver

Please Him with the "Mile-O-Meter" — The Gift That Every Man Wants — Improves driving efficiency — Saves Gas — Saves repair bills

The perfect and practical gift for every man and the man "who has everything" . . . with the "Mile-O-Meter" on his car's instrument panel he'll be a proud driver. He'll know just how many miles per gallon he's getting at all times, at every speed . . . he'll see just how efficiently his engine is operating . . . when it's time for a tune-up.

"Mile-O-Meter" makes any dashboard look even better . . . the 4 color dial tells the rate of gasoline flow, exactly what's going on under the hood. Built with fine watch precision and appearance, it lasts a lifetime . . . quickly transfers to any new car he may buy. Comes complete with 24-page booklet of easy-to-use instructions.

Fits all cars. Permanently mounted in 1 to 5 minutes. No holes to drill — no experience needed. Teaches you how to drive economically. Checks spark plugs, carburetor and 31 motor adjustments. Tested and approved. Performance charts and suggestions enable you to determine miles per gallon you are getting

DELUXE CHROME MODEL 3 5/8 Dia. . . \$14.95 Ppd.

STANDARD MODEL 2 3/4 Dia. . . \$9.75 Ppd.

Fed. Tax Incl.



MAIL THIS COUPON—TODAY!

order from **GALE HALL Engineering Dept. 18**
107 Northampton St., Boston 18, Mass.
World's Largest Producer of Tune-Up Gauges

Please send ☐ DELUXE ☐ STANDARD Mile-O-Meters at \$ _____

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Check enclosed ☐ C.O.D. ☐ Gift Wrapped (Free)

Makes a perfect gift.

MONEY BACK GUARANTEE



CUT ANY SIZE OR SHAPE

Curve, straight, irregular—every shape cut accurately. Precision circles any size from 1/4" to 6". This accurate, practical tool is needed in every tool kit for gaskets, discs, shims, patterns, designs, odd shapes and straight strips from cloth, board, fibre, foil, leather, rubber, paper or any pliable sheet material. Sturdy construction. Easy to use. Thousands in use by individuals and largest concerns. Complete with cutting board, blades, pivot pins—Model No. 755-A-1.—only \$9.30 postpaid (Check or money order) on money-back guarantee of satisfaction. Send for your Spearhead Cutter TODAY. Also available up to 60" capacity.

ZIMMERMAN PACKING CO. Dept. 37 **SPEARHEAD DIV.**
CINCINNATI 12, OHIO

PHONE SET

FOR INTERCOMMUNICATION

Two upright Western Electric phones with buzzers, push buttons, and 50 ft. of wire and battery. Installation diagram included. FOR: Home, Barn, garage, factory, shop, etc. Extra wire 2c per ft.

\$9.95 PER SET Shp. Chgs. \$1 anywhere in U.S.A.



JOHNSON'S FAIR

707 Glenwood Ave., Phila. 40, Pa.



NEW TINYTONE RADIO

Really Works—World's Smallest Carry in your pocket. New Preset Crystal eliminates All Tubes, Batteries or Electric "Plug-ins" Forever! Sweep band dial—Beautiful Red Plastic case.

GUARANTEED TO WORK on local stations—use most anywhere—home, cabins, farm, etc. **SEND ONLY \$1.00** (bill, ck., m.o.) and pay postman \$3.99 C.O.D. postage on arrival or send \$4.99 for P.P. delivery. **COMPLETE WITH EXTRA LONG DISTANCE** AERIAL KIT AND PHONE. **LIMITED SUPPLY—SO ORDER NOW!** MIDWAY Co. Dept. BPS-11 **KEARNEY, NEBRASKA**

FOR SPORTS — FOR FUN — FOR XMAS GIFTS!

World's Finest "EM-GE"

BLANK PISTOL

"Shoot the Works"—safely—with this handsome blank pistol. Looks and sounds real enough for the FBI. But it can't hold regular cartridges. Six-shot magazine; safety catch. Precision-built of carbon steel. 3 1/4" long. A world-famous pistol, excellent value at.... **\$10.95**

De luxe model with pearl handle **\$15.00**

100 blank cartridges **\$1.50**

J. L. GALEF & SON, Dep't. L-5, 85 Chambers St., N.Y.C.



ORDER BY MAIL

No Permit Required.

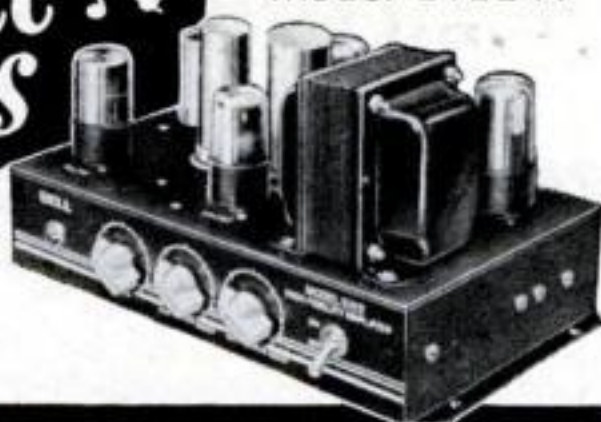
Send Check

or Money Order.

Dealer Inquiries Invited

Music Lovers

Model 2122-A



BELL
Hi-Fidelity
AMPLIFIER

**Finest Phono-Radio Reproduction
At Surprisingly Little Cost**

Now—as never before—you can have brilliant clarity in phono or radio reproduction for a surprisingly little cost. Measuring only 7½" x 6" x 11½" this Bell Unit can be easily built directly into either your present or custom-built console...enabling you to get the utmost from fine music! Embodies *pre-amplifiers* for various type magnetic pickups. Two special inputs for these pickups, with individual equalization, assures proper match and response. Separate input for radio tuner and crystal pickup. Bass and treble boost, plus attenuation, gives exact tone control. Also available with remote controls.

Write For Free Bulletin



BELL SOUND SYSTEMS, Inc.
564 Marion Rd., Columbus 7, Ohio



7 JEWELS!
3 YEAR SERVICE GUARANTEE

- Shock Resist
 - Sweep Sec. Hand
 - Chromed Case
 - Radium Dial
 - Gift Boxed
 - Leather Band
- LADIES' WATCH \$8.95 plus 90c tax
As described above—smaller size
Money back guarantee! Order today! Sorry, no C.O.D.

ELCO PRODUCTS
Dept. S11, 166 W. Washington St.
Chicago, 2, Illinois

\$7.95
POST
PAID
Plus 90c TAX

FINE OILING PROBLEMS?
Use GAUNT'S TOOLS for
Precision oiling in Home, Office, and Factory

"HYPO-OILER" **\$1**
One inch .025" dia. hypodermic needle easily reaches inaccessible parts. Just squeeze the transparent plastic oil chamber for desired amount. Convenient fountain pen size.

"HYPO-JR" —For superfine oiling. ½ the size of "HYPO-OILER". .016 dia. needle. Popular with hobbyists, jewelers, and others doing precision work. **\$1.25**
(Extra oil chambers—either size—20c each)

"HYPO-LUB" The handy pen size greaser with one inch genuine hypodermic needle .049" dia. and transparent grease chamber. Ideal for greasing bearings, etc. **\$1**

"HANDY-HYPO" **75c value ONLY 55c**
Screws on your favorite can or tube of oil, grease, glue, or cement. Has .049" dia. hypodermic needle. (Packed in extra oil chamber)

GIFT SET OF FOUR TOOLS IN ATTRACTIVE BOX
A complete lubrication kit—\$4.00 Value—ONLY **\$3.75**
See your dealer or order direct—Satisfaction guaranteed.
(C.O.D. orders, charges extra)—Dealers & Jobbers write.

GAUNT INDUSTRIES

827 Irving Pk. Blvd.

Chicago 13, Ill.

QUALITY PLUS
PRECISION...

Shopmaster

Tools and
Accessories

for
**BUDGET-MINDED
Hobbyists**



10" Tilting Arbor Bench Saw **\$78.95**

7" Tilting Arbor Bench Saw **\$47.95**

8" Tilting Table Bench Saw **\$51.50**

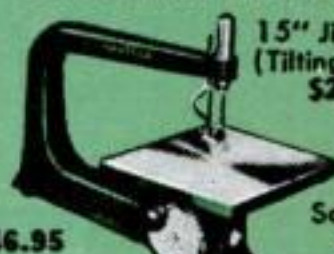
10" Tilting Arbor Bench Saw **\$86.95**

10" Floor Model Tilting Arbor Saw **\$105.00**



12" Drill Press **\$46.95**

12" Floor Model Drill Press **\$54.00**



15" Jig Saw (Tilting Table) **\$27.95**

Saber Saw **\$17.95**



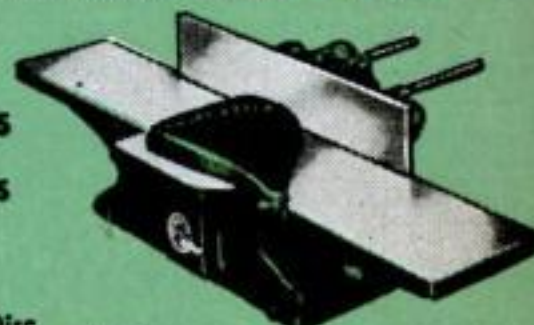
6" Jointer-Planer **\$79.95**

4" Jointer-Planer **\$47.95**



12" Band Saw **\$79.95**

10" Band Saw **\$46.95**



Belt and Disc Sander **\$51.50**



Spindle Shaper **\$45.95**

10" Wood Turning Lathe **\$45.95**

Zone 2 prices, slightly lower in zone 1.



WRITE TODAY FOR
FULL COLOR CATALOG.

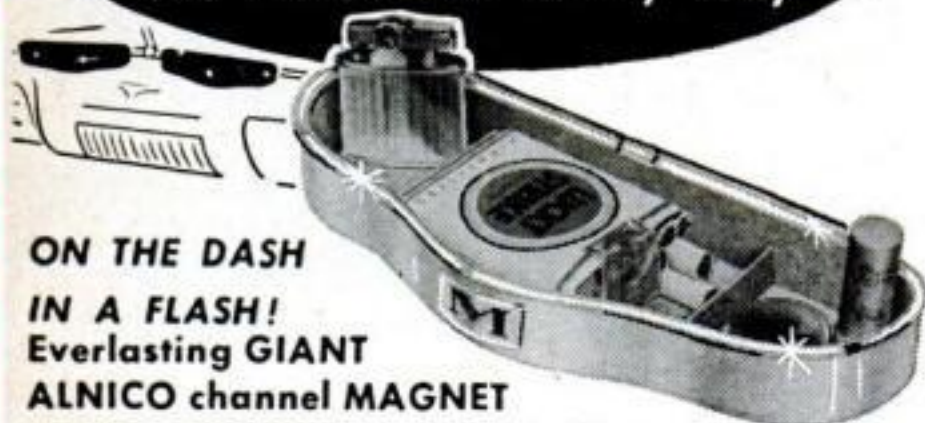
SHOPMASTER, INC.

1214 Third St. S., Minneapolis, Minn.

GIFT HIT with EVERY MOTORIST

Personalized
KROMEDGE DeLuxe
magnatray

The MAGNETIC Utility Tray



ON THE DASH

IN A FLASH!

Everlasting GIANT

ALNICO channel MAGNET

HOLDS IT TIGHT . . . Magically!

You'll be proud to own or give this Magnatray. It's truly DeLuxe—a "custom tailored" dash tray made for YOUR car. Three roomy compartments hold everything—tolls, cigarettes, matches, sunglasses, cosmetics, etc. VELVALINED to keep contents from rattling. Designed in durable plastic of Metallic Gold, Metallic Silver or Metallic Maroon. Surmounted with a gleaming CHROME RIM. PERSONALIZED with distinctive CHROME INITIAL. Individually gift-packed.

ORDER BY MAIL: Send \$2.50 for single tray or \$5.00 for matched pair. Mention color and initial desired. No C.O.D.'s please.

\$2.50
each
postpaid

KROMEDGE DIST. CO.

1571 46th STREET, DEPT. 18, BROOKLYN 19, N. Y.

NEW 1952 KING MIDGET

**WORLD'S
LOWEST PRICED
2 PASS.
AUTO**

**NEW PRINCIPLE OF ENGINEERING
FOR SMALL CAR PERFORMANCE**



Drive it for
75¢ PER WEEK

• Amazing performance. Surprising comfort. All steel construction. Full accessories, top and heater. Ready to run or assemble it yourself with our bolt together parts. Rider agents wanted, earn your car Free. Send 25c for detailed literature or \$1 (refunded first order) for actual assembly book and service manual filled with photos, drawings, specifications, etc.

MIDGET MOTORS MFG. CO. Athens, Ohio

PORTABLE GARAGE

USE IT ANYWHERE!

\$8.95

HEAVY GAUGE

- Goes wherever your car goes
- Takes little room
- Keeps rain, snow, dust, salt

\$10.95

(Extra Heavy Gauge) air, sun or sleet away & protects your car's finish • Durably constructed of clear transparent—heavy gauge vinyl plastic that is long wearing and tough • Spring-tite elasticized bottom, holds securely in all kinds of weather • Nylon threads and grommets for extra protection • Fits all makes and models • Direct from manufacturer • FREE! Carry-all case • 10 Day Money Back Guarantee.

Enclose check or money order, or sent C.O.D.

**MARDO SALES CORP., 480 Lexington Ave.,
DEPT. 081—New York 17, N. Y.**

DYNA-MITE F-M RADIO \$6.99
PACKS AMAZING POWER!

- World's most powerful tiny radio
- New ultra-high frequency circuit
- Covers full F-M band 88-108 M.C.
- Receives television programs (sound)
- Fully portable using tiny battery
- Can operate on regular house current
- Long range, clear tone, no static
- No antenna, no ground needed
- Not a toy, a real precision radio
- Picture diagram for radio beginners

Beautiful custom kit, all parts fully finished and ready to wire as shown Only \$6.99 Post Paid. Tiny ultra-high frequency tubes \$2.99 per Set. This Brand-New high quality set not available elsewhere at 10 times this price. Be the first one in your neighborhood to own one of these remarkable sets by ordering TODAY! NOW!

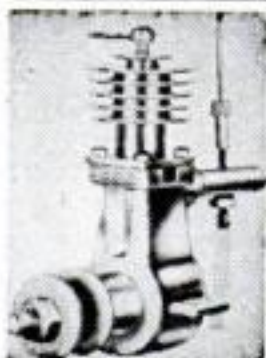
PRECISION ELECTRONICS LABORATORY
1852 Southwest First Street
Miami 35, Florida

HIGH POWER TELESCOPES

40 Power—opens to 36 inches. Precision & Polished Lenses. Ideal for Studying Stars, Plane Spotting or Interesting Pleasures. Satisfaction Guaranteed or Money Refunded. Send Check or Money Order to

\$3.49
Post-paid

CRITERION CO., Dept. PS-11, 438 Asylum St., Hartford 3, Conn.



REAL DIESEL ENGINE

\$2.95 • for planes, boats, midget cars
• 7500 RPM; 1/7 HP; ht. 3 1/2";
wt. 5 oz.

• precision machined for smooth operation
You just can't beat this price for a precision diesel engine! Streamlined, compact, easy to install. Thousands of satisfied users all over the world. Fast delivery if you ORDER TODAY! Send \$2.95 plus 25c postage.

**Gotham Hobby Corp. Dept. S, 107 E. 126th St.
New York 35, N.Y.**

2-WAY Voice Communication
UP TO 1/2 MILE!

ELECTRONIC WALKIE-TALKIE

A WONDERFUL GIFT TOY

—A PRACTICAL telephone system! This guaranteed Walkie-Talkie means years of fun for any boy or girl—

is also a useful step saver around the home. New improved model is patterned after U.S. Army and Navy equipment. NO batteries, NO outside power, safe, nothing to wear out! Operates on simple conductor line, outdoors, indoors, anywhere. Telephone clear reception. No license required. Two Walkie-Talkies in handsome plastic cabinets, complete with wire, only \$2.98. **MONEY-BACK GUARANTEE.** Order several sets for home and gifts. Send remittance, we pay postage or C.O.D. plus postage.

REMINGTON ASSOCIATES
41 Union Sq., Dept. 14, New York 3, N. Y.

ONLY
\$2.98
SET
PPD.



WEAR AT OUR RISK!
Money back!
If not delighted in
10 days

LIFETIME *Written* GUARANTEE!

**BUY WITH COMPLETE
Confidence!
AMERICA'S GREATEST
WATCH VALUE**

**BUY DIRECT AT PRACTICALLY WHOLESALE PRICES
FROM ONE OF AMERICA'S LARGEST DISTRIBUTORS!**



**MEN'S
WOMEN'S BULOVA
15 and 17 JEWEL
MOVEMENTS**
Originally
sold up to
\$58.95
\$16.95 Plus
\$1.70 tax

You get these unredeemed LIFE-
TIME GUARANTEED watches
in latest style Yellow Gold Cases,
at this sensationally low price
because we bought out SURPL.
STOCKS of leading N.Y. and MD. jewelers.
Order while they last! Specify make pre-
ferred and whether men's or ladies! Only
\$16.95 plus \$1.70 tax. Order now!

JEWEL SWISS WATCHES



ONLY \$6.95 Looks &
Performs
like a
\$25 WRIST
WATCH
Plus
70c
tax

Look at these many fea-
tures found only on ex-
pensive watches! Swiss,
precision engineered,
jeweled movement, both
shock and water protected,
radium dial, stainless steel
back, 1/5 second calibra-
tion, half-line sweep sec-
ond hand. Send \$6.95, plus 70c
tax. Order now at this low price.

WAR ON PRICES!

**17 JEWEL
INCABLOC**

• SHOCK PROTECTED!
• WATER PROOF!
• DUST PROOF!
• ANTI-MAGNETIC!
Worn by Army
Navy & Marines
During War

ORIG. \$59
Luminous dial,
sweep second hand,
Super Accurate, Im-
ported Swiss preci-
sion movement and
case. You
get these
brand new
LIFETIME
GUARAN-
TEED
watches now
for a small
fraction of
the original
price. You save
\$44.00 because
we bought out
surplus stock!

NURSES' MODEL \$16.95 plus \$1.70 tax!
FREE EXPANSION BAND! Order men's
style \$14.95, plus \$1.50 tax, or ladies' and
nurses' style, \$16.95, plus \$1.70 tax. Order
now at this low, low price.



YOU SAVE \$44

\$14.95

17 JEWEL AUTOMATIC
ORIG. \$71.95

**SELF WINDING WATCH
SET IT AND FORGET IT**
New Low \$21.95
Price

Precision
self-winding
movement,
keeps 40 hours
reliable time after few hours normal
wear. Water-tight case, anti-mag-
netic; shock-built; professional sweep
second hand, 17 full jeweled precision
Swiss movement. Wear it at our risk
... be completely satisfied. Now only
\$21.95, plus \$2.20 tax.



17 JEWEL CHRONOGRAPH
SAVE \$52.00! New Low Price!

Orig. \$71.95 \$19.95
Plus
\$2
tax

• WRIST WATCH
• STOP WATCH
• TELEMETER
• TACHOMETER
Precision 4-in-1 timepiece
for professional scientists,
aviators, engineers, sports-
men, etc. Nationally adver-
tised, 3 multi-function dials
automatically coupled, 30
min. register, Synchronized
seconds, 1/5 seconds. Lumi-
nous. Instructions included.
Unbreakable crystal. Only
\$19.95 plus \$2.00 tax. Order
now.



Free!

Handsome expansion band in-
cluded free with your order.
Write for **FREE WATCH AND
DIAMOND RING CATALOG.**
Practically wholesale prices to
user direct.

**TRIAL OFFER! Wear at Our Risk! Money Back if not Delighted! Order direct
from this Ad. For self and for Thrilling Gifts! Lowest prices ever, for these
lifetime guaranteed watches! Order now on famous lifetime written guarantee. Send
only \$1 down payment with order. Pay balance to postman on arrival, plus postage.
Or we pay postage if you enclose full payment plus tax with your order.**

AIR MAIL XMAS DELIVERY GUARANTEED!

MARYLAND DISTRIBUTORS, DEPT. 316, 501 E. Baltimore St., Baltimore 2, Md.



**The Perfect Gift for
Everyone On Your List!**
**ANTIQUE
AUTO SETS**
Only \$1.95 to \$3.95

Miniature 3/4" Scale Models---
Such Fun and So Easy to Build!



1904 Olds—\$1.95



1911 Maxwell—\$2.50



1914 Stutz Bearcat—\$3.95



1910 Model "T" Ford \$2.50



1911 Buick "Bug"—\$2.50



1909 Stanley Steamer \$2.95

Check "OLD TIMERS" You Want to Give:

- | | |
|--|---|
| <input type="checkbox"/> 1911 Maxwell \$2.50 | <input type="checkbox"/> 1911 Buick |
| <input type="checkbox"/> 1904 Olds \$1.95 | <input type="checkbox"/> "Bug" \$2.50 |
| <input type="checkbox"/> 1910 T Ford \$2.50 | <input type="checkbox"/> 1903 A Ford \$2.50 |
| <input type="checkbox"/> 1909 Stanley | <input type="checkbox"/> 1902 Franklin \$2.50 |
| Steamer \$2.95 | <input type="checkbox"/> 1906 Columbia |
| <input type="checkbox"/> 1909 T Ford \$2.95 | Electric \$2.50 |
| <input type="checkbox"/> 1903 Rambler \$2.50 | <input type="checkbox"/> 1910 Internat. |
| <input type="checkbox"/> 1913 Mercer | Harvester \$2.95 |
| Raceabout \$3.95 | <input type="checkbox"/> 1900 Packard \$2.50 |
| <input type="checkbox"/> 1906 "Old 16" | <input type="checkbox"/> 1903 Cadillac \$2.50 |
| Locomotive \$3.95 | <input type="checkbox"/> 1914 Stutz |
| | Bearcat \$3.95 |

Write to us—Add 25c for postage and handling. No. C. O. D.'s please.

hudson miniatures OLD TIMERS
"Originators of Antique Autos in Miniature"
SCRANTON HOBBY CENTER, Dept. 28, Scranton 10, Pa.

Recapture the days of the early auto-
mobiles forever in these exciting rep-
licas in miniature—each measuring
from 6" to 10 1/4" in length when com-
pleted. Historical, educational, au-
thentic—so faithful in detail they are
on display in 9 museums. Easy to
build because they come completely
pre-fabricated, with all ready-shaped
parts, including cast wheels, lights,
radiator, horn, etc. Easy to follow in-
structions included. Nationally
known; satisfaction guaranteed. At
toy, hobby and department stores.



\$12.50

We pay
postage
if payment
accompanies
order.

**Unique
POCKET
AUTO KIT**
Indispensable
Compact
Sturdy

GLEAMING
NICKEL
PLATED

**Ideal
Gift
for**

CHRISTMAS

The most beautiful and handiest pocket auto
kit ever invented—a tool chest in itself for
cars, bikes, boats, garden, and agricultural
implements, etc. Hand forged of finest alloy
steel by famous French craftsmen, 5 1/2" x 1 1/4".
Wrench with serrated jaws opens to 3/4", Phil-
lips patented screwdriver, flat screwdriver, tool
file, edge file, opener, cutlery knife, awl-punch.
Finest gift for birthdays, Christmas, prizes,
business good-will. If unavailable in your vi-
cinity, mail order to us. Satisfaction guar-
anteed.

Retailers' Inquiries Invited

SEABOARD STEEL CO. OF AMERICA, INC.
Dept. PS11, General Motors Bldg., New York 19



NEW MOSSBERG CATALOG

To make your Christmas selection easy

Complete lineup of rifles, shotguns, telescope sights and spotting scope, — all at low Mossberg prices — each readily obtainable at your dealer's.

Clip and fill in coupon now so you'll have plenty of time to pick a "Mossberg"



O. F. MOSSBERG & SONS, INC.
16511 St. John St., New Haven 5, Conn.

Send me without delay your new Christmas catalog of Mossberg Firearms available at my dealer's.

Name.....

Street.....

City..... (Zone)..... State.....

S-T-R-E-T-C-H YOUR DOLLAR

with these

MONEY- SAVING GIFT BUYS!

KODAK TOURIST—Kodak Lens (Reg. \$24.50) new, now.....\$18.32
BROWNIE HAWKEYE (Reg. \$5.50) Special, new.....4.07
DUAFLEX KODET—Model 1 (Reg. \$12.75) new.....9.12
KODAK TOURIST—F6.3 (Reg. \$47.50) new, special.....35.50

SPECIAL GIFT PACKAGES

(Includes Camera, Flash Gun, Film, Lamps, Batteries)

KODAK DUAFLEX FLASH Outfit, F 8 Lens.....29.25
KODAK BROWNIE HAWKEYE FLASH Outfit.....13.75
KODAK PONY 828 (Model B, Flash Holder).....55.00
ROY ROGERS Camera-Binoculars, Reg. \$7, special, new.....4.25
ARGUS GIFT OUTFIT (Camera, Case & Flash) special.....22.80

REPEAT SALE ON ROLL FILM

#116 10 rolls for \$1.00
Fresh Gevaert Film, #620, #120..... 5 rolls for \$1.00
#127—6 rolls for \$1.00 #616—4 rolls for \$1.00
GUARANTEED—LIMITED QUANTITY (add 10c for postage)

ORDER BY MAIL NOW—AND SAVE!

Please include sufficient postage with your remittance.

34th STREET CAMERA EXCHANGE

150 East 34th St. Dept. 311 New York 16

Useful, practical Christmas Gift—all metal lamp, with 12" flexible arm, in 6 sparkling wipe clean colors.

For shop, den, home or office. Desk or wall light, weighted base can't tip. Flexible arm bends to direct light anywhere. 6' UL approved cord, plug. Baked enamel colors: metallic gray, brass, bronze, forest green, Chinese red or chartreuse. Specify color, we pay postage. Check or Money Order only.

FREE—Xmas Gift catalog, of lovely lamps.

The LIGHTING MART

Dept. K37 Westwood, N. J.

HANG IT—STAND IT
BEND IT

6⁹⁵
Post paid



NEW AUTHENTICAST GIFT CATALOGUE PICTURING 75 DIFFERENT TANKS OF ALL NATIONS SEND 25c FOR YOUR COPY TODAY



Walker Bulldog 5180 \$1.75 Josef Stalin III 5707 \$2.00 Centurian 5012 \$2.00

COMET METAL PRODUCTS CO., INC., RICHMOND HILL 18, N. Y.

These tanks make ideal gifts for Collectors, Hobbyists, R. R. Enthusiasts, Veterans, and Boys of All Ages! Scale: 1" to 108"

Sale! SWISS-AUTHENTIC RE-REGISTER CHRONOGRAPH

Genuine RE-REGISTER model that computes distance and speed accurately to 1/5 of a second. RE-REGISTER is shock proofed—has full 17 Jewel movement, again resistant to shock of hard play or work. RE-REGISTER keeps accurate count of elapsed time while regular movement keeps accurate time of day. Perfect TIMER for Games, Events, Races, Shop Work, Photography, Engineers and Experimenters. AUTOMATIC SYNCHRONIZED Multi-Function dials are coupled for instant computation. Two Lever Models for starting and braking and re-registering on all dials. STAINLESS STEEL back, Radium Dials, Sweep-second hand, Krystal Kleer crystal. THIS IS NOT AN INFERIOR MODEL that often requires repair. RE-REGISTER IS GUARANTEED FOR LIFE!

Never a charge for adjustment or mechanical changes with the exception of parts.

MARDO Sales Corp.

Dept. 081

480 Lexington Ave.

New York 17, N. Y.

SALE PRICE \$21.95
TAX INC.



POWERFUL MIDGET MOTOR

DRIVES MODEL PLANES, BOATS, CONSTRUCTION SETS, Etc. WITH AMAZING SPEED! RUNS ON FLASHLIGHT BATTERIES!

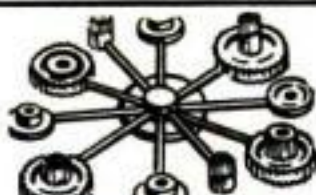
BOYS! MODEL-MAKERS! Get this new MIGHTY MIDGET D. C. Electric Motor. It's a honey! Looks and runs just like a big one. Motor is powerful yet measures only 1 x 1 x 1 1/4 inches; weighs one ounce! Turns up to 6,800 r.p.m.'s. REVERSES instantly. Motor is in durable black plastic housing. Comes complete with two 1 1/2 volt batteries in clip holder, transparent plastic gearbox—PLUS ten extra gears and pulleys for working out your own ratios. No shocks, sparks or shorts. And no transformer is needed. Endless hours of fun. Educational, too! Money back guarantee!



Runs on Ordinary Flashlight Batteries!



Multi-Ratio Gearbox Included!



Plus 10 Extra Gears and Pulleys!



ONLY \$2.98

Send no money. Order today. Pay postman only \$2.98 plus postage when delivered. Or send \$2.98 with order and we will pay postage. Supply is limited. Write NOW!

IMPERIAL SALES CO., Dept. B-006

114 East 47 Street

New York 17, N. Y.



NEW! Trash Disposal Unit Burns Refuse Safely

A new type outdoor dispose-all unit safely and quickly burns trash and even garbage in any weather. All refuse, damp, green or dry is fully consumed. Scientific draft design completely eliminates fire hazard of flying ash, sparks—minimizes smoke, smell. Nothing to get out of order. Needs no watching. Ends refuse hauling and fire hazards to quickly pay for itself. Measures 20" square at base by 34" high. Sturdily built. 2 bu. capacity. Recommended by Bureaus of Fire Prevention. Full price Model E now only \$12.95 shipped parcel post prepaid. Money back guarantee.

DELUXE WEATHER-PROOF MODEL EC—same specifications as above plus a baked-on, slate gray, ceramic finish that can't rust regardless of climate. Efficient—attractive—will last for years. Money back guarantee. Priced at \$15.95 shipped parcel post prepaid.

DELUXE WEATHER-PROOF MODEL D—weather-proofed with baked-on, slate gray, ceramic finish that cannot rust regardless of climate. Bigger, more efficient—measures 43" high by 24" square at the base with three bushel burning capacity. Sent complete with grate. Money back guarantee. Priced at only \$19.95 shipped parcel post prepaid. Please specify model desired and send check, cash or money order to:

ALSTO COMPANY, Dept. PS-11, Cleveland 1, Ohio



DICK TRACY WRIST RADIO

... for Kids from 6 to 60
WEAR IT LIKE A WATCH
USE IT AS A RADIO!

SHOCKPROOF—SAFE!

It really works. You've seen it in comic strips—now it's available for Xmas giving. Uses Radar Crystal Detector as developed by U. S. Air Forces. Receives regular AM radio broadcasts. Can be connected with wire for use as telephone system or as extra personal speaker for your home radio. Nothing to wear out or replace. Aerial and ground required for better reception. \$2.98 P.P.

LEOTONE RADIO CO., 65 Day St., Dept. P, New York, N. Y.

SILVER SOLDER TORCH & KIT \$7.50



Joins All Metals Permanently

★ IDEAL GIFT FOR HANDYMEN ★

Do your own repairing. Kit includes one tube silver solder flux and 10 5-in. lengths silver solder alloy. Hottest ALCOHOL TORCH known. 2700° F. flame. Operates in any position, indoors or out. Pint of special fuel included. TORCH alone with pint of special fuel \$6.50. KIT alone \$1.50. Complete instructions included. Add 25c on each order to apply towards shipping charges.

AMERICAN PRODUCTS CORP., 422 S. Dearborn St., Dept. 2-K, Chicago 5

MEN! WOMEN!

TAKE ORDERS FOR NATIONALLY ADVERTISED WATERLESS COOKWARE

Big Money Full or Spare Time Starting a Carlton Cookware Club

Big earnings daily taking fast orders for amazing new kind of Stainless Steel Waterless Cookware under Sensational Plan that makes it easy for every housewife to buy. Club privileges permit your customers to get Matched Sets of CARLTON WARE without missing the money—on sensational new Easy Payment "ADD-A-PIECE" Plan—PLUS up to \$8.00 worth of gift bonuses. No experience needed. We show you everything—supply everything FREE. Earnings start at once. Rush name and address. Be First!

CARLTON OF CARROLLTON, Dept. 27-T, Carrollton, Ohio



FREE! 20-Use Set of Stainless Steel Cookware and winter vacation in Florida given as bonuses



Black Sorcery

Daring Bare-back
She'll be entranced
with it

YOUR DREAM GIRL will be an exquisite vision of allurements, charm, fascination and loveliness in this exotic, bewitching, daring bare-back filmy sheer gown. Its delicate translucent fabric (washes like a dream) will not shrink.

Have Paris at home, with this cleverly designed halter neck that ties or unties at the flick of a finger. Lavishly laced midriff and peek-a-boo bottom. She'll love you for this charm revealing Dream Girl Fashion. In exquisite black sheer.

SATISFACTION GUARANTEED or your money back.

DREAM GIRL FASHIONS, Dept. 330
318 Market St., Newark, New Jersey
 Please send **BLACK SORCERY** gown at \$9.95. If not entirely satisfied, I'll return within 10 days for full cash refund.
☐ I enclose \$9.95 cash, check or money order, send postage prepaid (I save up to 90c postage). (You may get it at our store too!)
☐ I will pay postman \$9.95 plus postage. Check size wanted: **32 34 36 38 40 IN BLACK ONLY** (If you don't know the size send approximate height and weight)
 Name.....
 Address.....
 City..... State.....

FREE

NEW BIG RADIO CATALOG



Ready now! Complete with everything in radio, TV and electronics. Newest parts as well as old, standard lines. Paste coupon on penny postcard and mail today!

Lafayette Radio

DIV.: RADIO WIRE TELEVISION, INC.

NEW YORK 13.....100 Sixth Avenue
NEWARK 2.....24 Central Avenue
BOSTON 10.....110 Federal Street
BRONX 58.....542 E. Fordham Road

**30 YEARS
OF
VALUES**

LAFAYETTE RADIO, Dept. KI-1
100 Sixth Avenue, New York 13
Please rush Free catalog to:

PASTE
ON
PENNY
POSTCARD

Name.....
Address.....
City.....State.....

Learn this Profitable Profession



**IN 90 DAYS
AT HOME**

Money-Making Career Open to Men and Women, 18 to 60

Hundreds of men and women between 18 and 60 make \$10 to \$20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.



NEW 32-PAGE BOOKLET FREE

Fill in the coupon below (please print name and address) and mail it for your FREE copy of 32-page information Booklet. If you act at once we will include Anatomy Charts and Success Booklet which supply additional information you should have. All will be sent postage paid.

THE COLLEGE OF SWEDISH MASSAGE
Dept. 170P, 41 E. Pearson St., Chicago 11, Illinois

Please send me FREE and postpaid New 32-Page Illustrated Booklet, Anatomy Charts and Success Booklet at once.

Name.....Age.....
Address.....
City.....State.....

LEFAX

POCKET SIZE TECHNICAL DATA BOOKS \$1. EACH

Printed on loose leaf, six hole, 6 3/4" x 3 3/4" bond paper, each book contains about 140 pages of technical data, presenting condensed, accurate and essential data for the student, engineer, technical worker and business man.

Architecture
Home Heating
Illumination
Electrician's Data
Builder's Data
Lumber Data
Air Conditioning
General Math.
Math Tables
Physics
Chemical Tables
Metals
Gen. Chemistry
Reinf. Concrete

Building Constr.
Radio
Television & FM
Electricity, AC
Electricity, DC
AC Motors and
Generators
Transformers,
Relays, Meters
Hydraulics
Surveying
Mech. Drawing
Machine Design
Machinists Data

Piping Data
Surveying Tables
Trig-Log Tables
Metallurgy
Analytic Chem.
Highway Eng.
Mech. of Materials
Pwr. Trans. Mach.
Thermodyn. Tbls.
& Charts
Phys. & Thermo-
dyn. Data
Phys. & Org. Chem.

Write for FREE catalogs (over 2000 listings). See for yourself how helpful LEFAX can be to you. Send \$1 for each book, (or \$5 for any six books listed above) to

LEFAX DEPT. PS-2 PHILADELPHIA 7, PA.

ANALYZE HANDWRITING

MORE INCOME, Prestige, Success, Fascinating uncrowded profession-business, full or spare time. FREE illustrated lesson & Year Book shows how men and women in home, business and professions analyze handwriting to understand people, MAKE MONEY. FREE lesson and information about unusual opportunities if over 21.



I. G. A. S., Inc., 715 Wilhoit Bldg., Springfield, Mo.

Quick, EASY Way to REPRODUCE any Object

Make exact duplicates of trays, lamp bases, medals, figurines, vases, etc. right at home overnight! New RUBBER MOLD method needs no heat-curing. No special skill or tools required. Make perfect reproductions of objects of clay, plastiline, wood, metal, glass in any quantity! Cost will be only few cents. Send for Brochure 511 which gives exact step-by-step instructions anyone can understand and follow. Send 10c for it today to



SCULPTURE HOUSE, 304 West 42nd Street, New York 18, N. Y.

BATTERIES START A FACTORY AT HOME



—and re-cast junk batteries into new, with and without new materials; the latest achievement. We supply complete instructions and everything needed. Large daily profits.

BATTERY LABORATORY SCHOOL
DEPT. PSM, MINNEAPOLIS 4, MINNESOTA

When Writing Advertisers Please Mention Popular Science

Sensational Device Tests Eyes



SAVE up to \$15.00 on Glasses!

Big news to the millions of Spectacle Wearers and Prospects. Means Freedom from Outrageous Prices. Sold on Money-back Guarantee.

MAKE BIG MONEY QUICK with SAMPLE KIT!

Show it to friends and others. Let them use it Free and watch their amazement over this Self Testing system. Here is a great new opportunity in a tremendous new field of unlimited possibilities. Spare or full time. No experience needed. Write for complete sample kit.

C.G. Optical Co., Dept. A-109, 20 E. Delaware Pl., Chicago 11, Ill.

SAVE UP TO 50% AND MORE

OUT OF PAWN

GENUINE DIAMONDS

VALUES FROM \$10 TO \$10,000

TIME PAYMENTS ARRANGED

Send for Illustrated **FREE Catalog**

All diamonds reset in brand new modern mountings. Sold with a written iron-clad money back guarantee. Over 100,000 satisfied customers have bought diamonds from Berman's.

Our Reference - Your own Bank or any Mercantile Agency

Berman's Diamond Loan Bank

Dept. PS - BERMAN BLDG., BALTO. 1, MD.

Diamonds from estates, banks, unredeemed pledges offered at substantial savings

MASTER MIND!

Learn Short-Cut Mathematics

Juggle figures, do baffling number tricks. Make people gasp at your marvelous lightning-quick mind. Multiply 4 figures by 4 figures without using old-fashioned multiplication! Big cloth-bound volume; fully illustrated course. Includes worked-out problems, answers, etc. Sensational bargain, only \$1.95, postpaid-or C.O.D. plus postage. Satisfaction guaranteed or refund. Order this amazing "Short-Cut Mathematics" today!

NELSON-HALL CO., 210 S. Clinton St. Dept. 4L-1 Chicago 6, Ill. \$1.95 Complete

GOLD - SILVER - COINS

Easily located with new Light-weight M-Scope Detector. Superior performance, lowest price, monthly payment plan.

FREE LITERATURE

FISHER RESEARCH LAB., INC. PALO ALTO CALIF.

learn to HYPNOTIZE!

Command others with hypnotic power! Amaze everyone with your new spellbinding technique. New easy to master course teaches you this mystic art, quickly, expertly, professionally. Have subjects at your mercy. Make them obey your every desire. Send for this Valuable Book Now! Just pin \$1 to this ad and "25 lessons in Hypnotism" will be mailed to you postpaid. Satisfaction guaranteed or your money back.

Books Publishing Co., 56 W. 24th St., New York 10, N. Y.

READ ABOUT TRAILERS BEFORE YOU BUY

TRAILER TOPIC MAGAZINE

Brings you the latest in Trailer Coaches—Equipment—Accessories—Trailer Trips—Trailer Parks and many other interesting features at only—\$3.00 for 2 years.

6 month trial subscription \$1.00

Send your subscription to

TRAILER TOPICS MAGAZINE, (Room 1524) 28 EAST JACKSON BLVD. CHICAGO 4, ILL.

To skilled men:

LOCKHEED

in

CALIFORNIA

offers you a

BETTER JOB

in a

BETTER PLACE TO LIVE

Lockheed is building planes for defense, planes for the world's airlines. It's all part of our long-range production program. It means there's not only a better job for you at Lockheed, but a better life. For here in sun-swept San Fernando Valley you find living conditions beyond compare.

Lockheed needs:

Machinists
Tooling Men
Engineers

Aircraft experience is not necessary. Lockheed will train you.

Lockheed offers you: Top wages, generous travel allowances to be paid after six month's employment at Lockheed, retirement plan and many other benefits only a company like Lockheed can provide.

Middle-age is no barrier to a job at Lockheed. Skill and ability, not years, count here.

To Family Men:

Housing conditions are excellent in the Los Angeles area. Approximately 30,000 rental units are available. Huge tracts are under construction for home ownership. Lockheed Employee Service will help you get settled.

Write today for job application blank and illustrated brochure describing life and work at Lockheed in Southern California. Use handy coupon below.

M. V. MATTSON, Employment Manager
LOCKHEED AIRCRAFT CORP., Dept. P S11, Burbank, Calif.

My Name _____

My Type of Work _____

My Street Address _____

My City and State _____

Spot ANY Car Trouble



in a jiffy!

Handy Guide Helps Find What's Wrong Fast!

Don't waste time and work trying to track down car and truck troubles. Let MOTOR's new TROUBLE-SHOOTER help you find them FAST. Prepared by Editors of famous MOTOR's Manuals. Lists 1760 specific causes of auto trouble—knocks, misses, noises, breakdowns, etc. If car has

Connecting Rod noise—just turn to Connecting Rod Section for the 8 things that can be wrong. Covers engines, clutches, brakes, ignitions, new automatic transmissions, etc. Fits right in pocket for instant use. Spiral binding lets book stay open while you work. Cross-section PICTURES. Valuable help for beginners, experienced mechanics.

TRY IT AT OUR RISK Deposit \$1 with postman, plus C.O.D. chgs. on delivery. Use 7 days, if not delighted, your \$1 back. (SAVE C.O.D. Chgs. by sending \$1 now.) Write: MOTOR Book Dept., Box AH., 250 W. 55th St., N.Y. 19, N. Y.

Tells how to Spot 87 Automatic Transmission Troubles, 8 Causes of Connecting Rod Noise, 82 Causes for Engine "Misses", 45 Causes of Excessive Oil Consumption, 14 Common Causes of Crankshaft Noise, 73 Checks for Clutch Troubles, 66 Causes of Rear-Axle Trouble, 81 Causes of Brake Trouble, 27 Checks for Faulty Springs and Shock Absorbers, 84 Different Types of Wheel Troubles . . . LOTS MORE.

WALKIE TALKIES ONLY \$4.99 for a Complete Set of 2

POCKET SIZE

—ELECTRONIC VOICE POWERED



No tubes, batteries, adjustments, license or permit needed! Guaranteed to work anywhere up to 1/4 mile with extra wire. Swell for room to room—garage to house, etc! Your own private, talk-listen phone. Not war surplus. Brand new, Guaranteed. Two complete units with wire —READY TO USE!

SEND \$1.00 deposit and pay postman \$3.99 plus postage charges or send \$4.99 for postpaid delivery. Limited Supply.

THE MIDWAY COMPANY, Dept. WPS-11, Kearney, Nebraska

OWN a Business.. a life income



Clean & Mothproof rugs, upholstery

Would you like to own a nationally advertised business which can earn you \$15 in profits a day on EACH of your service men? Easy to learn. Start full or part time. No overhead. Service rendered in homes, hotels, offices, etc. DURACLEAN cleans, revives, brightens carpets and upholstery . . . used again within a few hours with no inconvenience to customers.

DURAPROOF protects fabrics from moths and carpet beetles . . . Money Back, 4 YEAR WARRANTY.

Send for 16 page booklet explaining details. We furnish enough material to return your total investment. Territories are limited. Write today!

Duraclean Co., 1-18N Duraclean Bldg., Deerfield, Ill.

Watch Repairing Pays Big Money Learn at home

Free Literature Tells How

Watchmakers in big demand. You train step-by-step under experts. You learn to take a watch apart—repair and put in perfect working order. 10 easy lessons. We furnish all tools, and a 15 jeweled watch. Practicemovement with first lesson.



Turn spare time into cash—perhaps a business of your own. A licensed school. Students 18 to 65 have profited by our training. Low cost.

Write Today for All the Facts—No Obligation

ILLINOIS SCHOOL OF WATCH REPAIRING

2870 Elston Ave., Dept. PS-11, Chicago 18, Ill.



NEW CHEMICAL MITT

Sensational! DRY Window Cleaner! Uses no water, no messy liquids. Chemically Treated. Simply glide over windows; leaves glass sparkling clear. No heating water, no heavy buckets to carry. No rags, powders, sponges, chemicals. No mess or muss. No red chapped hands. Dust, dirt, grime, fog disappear like magic. Wonderful for auto windows, windshields!

SAMPLES FOR AGENTS Sample offer sent immediately to all who send name at once. A penny postal will do. SEND NO MONEY just your name. KRISTEE CO., Dept. 709, AKRON 8, OHIO

ELECTRIC MOTORS- \$19.50 F.O.B.

1/3 H.P. Capacitor Type

Des Moines

1000 Guaranteed new, heavy duty, 110V - 60 Cy - 1ph. current, Nema resilient mounted base. Retail for over \$30.00. Nationally known brand, made by Wagner and Jack & Heintz. No C.O.D. shipments—money order only. Write for special quantity price.

WESTERN TOOL & STAMPING CO. 2725 2nd Avenue Des Moines, Iowa

make your own Gems

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only \$29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M Burlington, Wis.

29.50
F.O.B.



F-L-A-S-H YOUR TURNS

INSTALL FLASHING DIRECTIONAL TURN SIGNALS ON YOUR CAR. ELIMINATE HAND SIGNALLING

Only \$6.95 Postpaid C.O.D.'s Extra

All wire, bulbs, fixtures and materials supplied in complete kit, plus handsome control switch with reminder light that flashes when signals flash. Use existing parking & tail lights. No drilling necessary. No outside mountings. Easy-to-follow instructions. Tested & Approved to meet S.A.E. Standards.

Specify Make & Year of Car When Ordering. Money-Back Guarantee. **RAY PRODUCTS CO., 139-P N. Clark St., Chicago 2, Ill.**

MONTH AFTER MONTH, YEAR AFTER YEAR, YOU SEE OUR AD. REMEMBER IT'S DANGEROUS to pay less if you want the finest nonskid USED tires.

GOOD YEAR Firestone

GOODRICH, UNITED STATES, GENERAL, & OTHERS, NOT RECAPS

Our policy is to select your tires so carefully, as if our very future depended on the service given by that particular tire.

FREE TUBE WITH "ALL" BLATT'S GOOD GRADE TIRES

GOOD GRADE, 16 MONTHS GOLDEN RULE GUARANTEE BOND.			
600-16 \$4.14	700-15 \$4.54	650-20 \$7.94	32x6(8) \$ 8.64
650-16 5.42	670-15 4.74	700-20 8.54	32x6(10) 9.94
700-16 5.04	710-15 4.94	750-20 8.64	900-20 13.94
650-15 4.44	550-17 4.64	825-20 15.92	1000-20 13.94

FINEST GRADE, 26 MONTHS GOLDEN RULE GUARANTEE BOND

THIS GRADE MADE THE BLATT NAME "WORLD FAMOUS."			
450-20 \$6.00	450-21 \$6.00	700-15(6) \$10	750 16(8) \$15
600-16 5.49	650-15 5.95	600-20 9.94	900-20 18.54
650-16 6.42	670-15 6.24	650-20 9.94	1000-20 18.54
700-16 7.94	700-15 6.54	700-20 11.94	1100-20 18.54
750-16 7.94	710-15 6.34	32x6(8) 10.54	1000-22 17.54
550-17 5.94	760-15 6.54	32x6(10) 13.92	1100-22 18.54
525-18 5.94	820-15 7.04	750-20 12.54	1200-22 22.54
650-19 9.00	475-19 5.94	825-20 22.84	1100-24 21.54

Factory Rebuilt Nu-Tred Snow Tires

26 Month Guarantee		
640-15 650-15 550-16	750-20 STD. \$10	
550-15 700-15 600-16	" RUGGED \$16	
670-15 760-15 650-16	750-16 RG. \$19	
710-15 820-15 550-17	900-16 RG. \$11	
ANY SIZE \$11		

BLATT BLATT BLDG., GIRARD & LANCASTER AVES., DEPT. P.S., PHILADELPHIA 31, PA.

Send check or money order and this ad for rush shipment. We won't ship a tire we wouldn't use. The name to trust in rubber. PRICES SUBJECT TO CHANGE

Shipments RUSHED Down South. Up North and Far West

MASTER COURSE IN HYPNOTISM

SECRETS REVEALED! Actual methods, techniques of master hypnotists... how to hypnotize suitable subjects at a glance—a command—by phone! How to control subjects after they awaken—help break tobacco, other habits. Self-hypnosis. Group hypnosis. Entertain with amazing hypnotic stunts for fun or profit. Get this easy-to-understand, how-to-do-it course now! Money-back guarantee. Fully photo-illustrated... \$2 (complete). EXTRA! Unique "ALARM-CLOCK MIND" instruction folio and Hypnotic Catalog No. 2 included. Order "Hypnotism Course" today!

POWER PUBLISHERS, Dept. PS8, 790 Broad St., Newark, N. J.

ILLUSTRATED COMIC BOOKLETS FOR MEN ONLY! POCKET SIZE!

THEY'RE TERRIFIC! PACKED WITH RARE CARTOONS and GOOD CLEAR ILLUSTRATIONS AS YOU LIKE IT. RICH IN FUN and HUMOR. 20 BOOKLETS ALL DIFFERENT, SENT PREPAID FOR \$1 IN PLAIN SEALED WRAPPER. NO C.O.D.s.

NATIONAL, Dept. 478, BOX 5-STA. E, TOLEDO 9, OHIO

DIRTY HANDS

can be a problem, especially after tire changes or auto repairs on the road. A jar of KLEENZ will solve those problems. NO WATER NEEDED, just rub on KLEENZ and wipe off on paper or rags and hands are clean. This new Waterless Hand Cleaner removes grease, ink, paint, tar, etc. without abrasives or harsh chemicals. Contains LANOLIN for skin care. Ideal for Printers, Mechanics, Painters or any one with dirty or soiled hands. Send \$1.00 or your name and we will send COD for \$1.00 plus postage. Money back if not satisfied.

DEALERS INVITED

RECOVERY CHEMICALS, SOAP DIV. 817, 55 E. Washington St. Chicago 2, Ill.

COLD got you? MAKE A FRIEND OF

Take TABCIN to check cold misery quick! TABCIN checks sneezes and sniffles, helps relieve headache and feverish feeling. Eases aches and pains. TABCIN contains a tested anti-histamine in compound with other ingredients to give more complete relief for cold distress.

Tabcin

45c and 75c

ALL DRUG STORES in the BRIGHT RED package

NEW AC Aluvac ELEMENT

AC OIL FILTERS

Protection

New AC Aluvac Oil Filter Element Means Longer Life for Your Car!

In these uncertain times, wise motorists are taking thoughtful steps to prolong the life of the engines of their cars.

An AC Aluvac Element installed in your oil filter is the best move you can make toward guarding your car's engine against clogged piston rings and gummed valves—expensive wear and repair. AC Aluvac Elements provide important protection against the dirt, abrasives, moisture, and acids that cause excessive wear.

AC Aluvac Oil Filter Elements are new and different—far better than previous types. Size for size, they have 10 times the filtering area and twice the sludge retention capacity. The tiny pores of the special Aluvac material are so small they trap particles of a microscopic 1/100,000th of an inch.

Your AC dealer has an Aluvac Element to fit almost all makes of filters. Let him help you to get longer engine life by installing one in your car.

AC SPARK PLUG DIVISION **GM** GENERAL MOTORS CORPORATION

Get a "HEAD START" WITH NORTHROP Training!

★ AERONAUTICAL ENGINEERING
★ AIRCRAFT & ENGINE MECHANICS

Get a "head start" in your Aviation career with Northrop training. Qualify FASTER for a profitable, permanent, and interesting future! NORTHROP TRAINING can bring promotion and bigger pay YOUR way. A Northrop Graduate is backed by the prestige of the famous Northrop name—he has a "head start" to opportunity and success in Aviation.



Excellent Training Facilities At Northrop you'll use the newest training aids—live jet engines, wind tunnel, single and multi-engine aircraft, outstanding laboratory and shop equipment. Northrop instructors keep up-to-the-minute with the rapidly advancing science of aviation. You'll learn thoroughly in minimum time!

Military Advantages For You In civilian or military life, Northrop training counts. For example, NAI engineering graduates are qualified educationally to become Air Force or Naval Aviation Cadets or Officer Candidates.

Northrop Aeronautical Institute

APPROVED FOR VETERANS

1525 E. Broadway, Hawthorne, Los Angeles County, Calif.



NORTHROP AERONAUTICAL INSTITUTE
1525 E. Broadway, Hawthorne, Los Angeles County, Calif.

Please send me immediately the Northrop catalog, special military information and employment data, and schedule of starting dates of classes. I am interested in:

☐ Aeronautical Engineering ★ Aircraft & Engine Mechanics ☐

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

☐ VETERANS—Check here if you are entitled to training benefits under the G. I. Bill.

TALK TO THE WORLD!
PREPARE FOR F.C.C. NOVICE

AMATEUR RADIO LICENSE

Be a "Ham" in a Few Days—No Experience Needed! Operate Your Own Station—Enjoy the "Hobby with a Future"

FULL PRICE
ONLY
\$26.95
COMPLETE

TERMS
IF DESIRED



- 36 4-min. code recordings (alphabet thru 6 wpm)
- 2 12-record albums
- Telegraph Key
- Tone Record for Sending Practice
- Instruction on Sending, Radio Theory, & F.C.C. Regulations.
- Pre-F.C.C. Exams graded FREE by E.T.I.
- MONEY-BACK GUARANTEE
- With PHOTOSOUND, you SEE the material & HEAR your instructor!

5-DAY TRIAL SEND NO MONEY MAIL COUPON NOW!

ELECTRONIC TECHNICAL INSTITUTE Dept PS 111
830 Venice Boulevard, Los Angeles 15, California

☐ Please send NOVICE LICENSE COURSE for 5-day No-Risk Examination. On arrival I will pay the postman \$26.95 plus C.O.D. charges.

☐ Check here if you enclose \$26.95—We pay delivery charges. Send information on: Novice License ☐ Advanced Amateur License ☐

Commercial License ☐

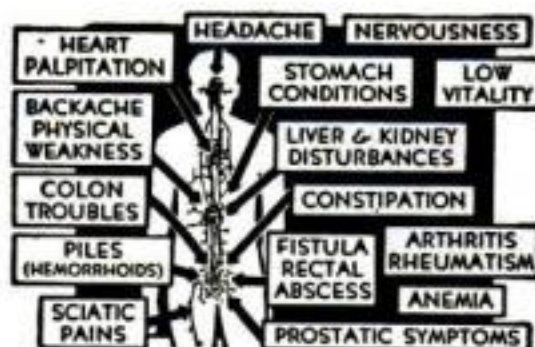
Name _____ Age _____

Address _____

City _____ Zone _____ State _____

Fistula Is Real Threat

**FREE BOOK—Explains Other
Related Ailments**



40-page FREE BOOK—tells facts about Fistula, Rectal Abscess, Piles and other rectal and colon disorders; also related ailments and latest corrective treatments. Thornton & Minor Hospital, Suite 1149, 911 E. Linwood, Kansas City 3, Mo.

RETIRE IN 5 YEARS

Have better life. Earn big money. Retire in 5 yrs. Raise playful, profitable Chinchillas. Easy to raise in spare time. Minimum work, overhead. Write today for FREE details on plan which will insure your future.

FISHER'S KEY CHINCHILLA EXCHANGE
Dept. PS-11, 1611 Montana Ave., Santa Monica, Calif.



BULCO, Dept. 95

ILLUSTRATED COMIC BOOKLETS

THE KIND MEN LIKE!
THE GIRLS LIKE IT TOO!!
(VEST POCKET SIZE)

They are loaded with rare cartoons. Full of Fun and Humor. 20 DIFFERENT booklets sent for \$1 in sealed wrapper. No C.O.D.

Box 382-K, G.P.O., N.Y.C. 1

MANUFACTURE BUILDING BLOCKS

Easy to start your own profitable business. General high speed, low cost Concrete Vibrator Block Machine produces 1000 blocks in 8-hour day. All sizes and shapes. Complete details FREE. Mail \$1 for wonderful book, "How to Build Your Own Concrete Block Home."

Only
\$218



GENERAL ENGINES CO.
307 HUNTER ST., S-111 GLOUCESTER, N. J.

DON'T PULL HAIR FROM NOSE

May Cause Fatal Infection

Use the **KLIPETTE** Rotating Scissors

REG. U.S. PAT. OFF.

You can cause serious infection by pulling hair from nose. Ordinary scissors are also dangerous and impracticable. No better way to remove hair from nose and ears than with KLIPETTE. Smooth, gentle, safe, efficient. Rounded points can't cut or prick skin.

So Simple! Just turn the end. Surplus hair clipped off gently, safely.

\$1 in fine surgical steel. Also in Gold Plate, \$4.20 FTI.

Guaranteed to Satisfy or Money Back

HOLLIS CO., 1133 Broadway, New York 10, N.Y. Dept. G-11

Enclosed is \$1.00 for KLIPETTE. If I am not entirely satisfied, I may return it within 10 days for refund.

Name _____ Address _____

not everyone
does as well, but
E. O. Lockin,
who started a
business of his
own, reports...

for 12 months I've averaged
\$800 PER MONTH
INCOME
—most of it clear profit for me!



• Mr. Lockin expresses his grateful thanks for the opportunity to make a decent living on his own. Many men have discovered how to be independent, to be freed of bosses and layoffs—to build their own future on a steady, dependable foundation. L. A. Eagles grossed more than \$200 his first week. R. E. Traynor says, "I made \$62 gross in one day." Others report gross from \$100 per week to \$12,000 per year.

How much you make depends largely on you. You need no special skill, no large investment to start.

No shop necessary. Our ELECTRIC RUG WASHER cleans rugs and carpets like new right on the floor...removes dirt and grime and helps to show their natural color and beauty. So efficient and safe for carpets, it is used by largest hotels and railroads.

You take no risk. Machines fully guaranteed. Mail coupon today for complete information including how to start making big profits quickly in YOUR OWN business. BIG opportunity. Send coupon now.

VON SCHRADER MFG. CO., RACINE, WIS.

You, too, can start
your own business. No special skill, no
large investment required. Costs nothing
to find out—no obligation. Mail coupon
today for interesting **FREE** book.

.....
• **VON SCHRADER MFG. CO.,**
• E11PL, Racine, Wisconsin

• Send at once (no obligation) your **FREE**
• booklet containing information about your
• **ELECTRIC RUG WASHER** and how I can start my
• own permanent, profitable business.

• Name.....
• Address.....
• City..... Zone..... State.....
•

HERE IS THE NEW SENSATION IN LOW-COST TRANSPORTATION

Truly, Cushman EAGLE is the new sensation in its field. It operates for only $\frac{3}{4}$ ¢ per mile, cruises to 50 m.p.h., gets over 75 miles per gallon. Dealer inquiries invited.



Cushman

EAGLE

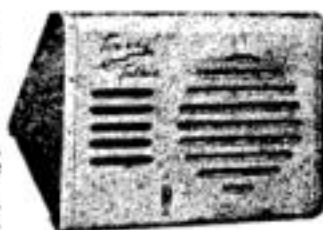
WRITE FOR DETAILS
AND SPECIFICATIONS
DEPT. 22-S

CUSHMAN MOTOR WORKS Lincoln, Nebr.



**U.S. AIR CORPS
FLYING HELMETS
3 for \$1.00**

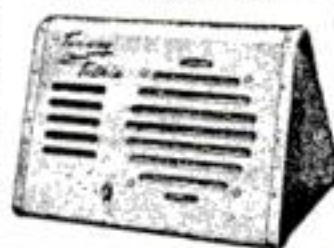
Brand New! Send only \$1.00. We will prepay one small, one medium and one large size genuine Air Corps Flying Helmet. For pilots, racers, sportsmen, etc. Excellent gift.



**BRAND NEW
TWO-WAY TALKIES**

Mfg. by
Dictograph Corp. \$16.95 Pair
Two way conversation from room to room, office to office, building to building, etc. No outside power required, operates on standard flashlight batteries. Additional stations may be added as needed. Two stations, complete with wire, guaranteed... ready to use only \$16.95. Payment with order—we pay postage.

FLASH



2250 McKinley, Dept. S-1

SHAW'S SURPLUS

FRESNO, CALIF.



**ART OFFERS YOU A
PROFITABLE CAREER!**
Trial Plan Proves You Can Learn to Draw

Yes! W.S.A. Has Trained Thousands At Home—In Spare Time For 37 Years. Be an artist—learn **COMMERCIAL ART, DESIGNING, CARTOONING**—all in one complete home study course.

Many students earn extra money while learning by designing posters, signs, simple artwork, etc. Become your own boss. No previous art experience necessary. We teach you step-by-step. **TWO ART OUTFITS** included with training. **FREE BOOK** "Art for Pleasure & Profit"—tells about our course, what graduates say and commercial opportunities for you. Low cost—easy terms. Ask for New Trial Plan.



MAIL COUPON for FREE BOOK

WASHINGTON SCHOOL OF ART
Studio 1311A, Washington 5, D. C.

Send me without obligation Free Book, "Art for Pleasure and Profit." No salesmen. (Please print)

Name.....
Address..... Age.....
City..... Zone..... State.....

☐ I am interested in your new Trial Plan

The NEW Model 50 UTILITY TESTER FOR REPAIRING ALL ELECTRICAL APPLIANCES-MOTORS an all-around electrical trouble shooter



- Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, etc.
- Will measure the current consumption while the appliance under test is in operation. The appliance or utility may be plugged directly into the front panel receptacle. A special pair of insulated clip-end leads is included for motors, etc.
- Incorporates a sensitive direct-reading resistance range which will accurately measure all resistances commonly used in electrical appliances, motors, etc. This range will enable continuity checks and tests for shorts and opens.
- Will test thermostats, radio tube filaments, bulbs, fuses, fluorescent, condensers, switches, field coils, circuit breakers, lighting systems, etc.

Handsome round cornered molded bakelite case $3\frac{1}{8}'' \times 5\frac{7}{8}'' \times 2\frac{1}{4}''$. Complete with all test leads and instructions.

\$13.90

**SOLD ON EASY PAYMENTS
AT THE NET CASH PRICE**

No interest or carrying charges added. Simply remit \$3.90 with order, pay balance, \$2.00 per month for 5 months.

SUPERIOR ELECTRONIC CO., INC.
Dept. B-38 • 227 FULTON STREET • NEW YORK 7, N. Y.

PROPANE GAS ON YOUR CAR

with normal operation on gasoline. Switch to either instantly—Save up to $\frac{1}{2}$ on fuel. SEND \$2.00 for "How-to-do-it" booklet, photos, drawings and low prices on complete outfits. (Refunded on parts order.) Rush order today—NOW!



LPG PRODUCTS
Dept. PS-11 Kearney, Nebraska

Prepare Now!
ENGINEERING
B.S. DEGREE IN 27 MONTHS
WORLD FAMED SCHOOL • ESTABLISHED 1884

Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (Television) Engineering, Business Administration and Accounting. Also 36-weeks diploma courses in Surveying and Drafting.

Personalized instruction. Accelerated courses. For ambitious earnest students. Preparatory department.

Graduates in Demand. Hold positions of responsibility the world over. Placement service. Future shortage of engineers indicated. Prepare now, for the civil and military opportunities ahead.

Extensive campus. Well equipped, modern buildings and labs. Low cost. New terms start quarterly. Enter January, March, June, September.

Mail Coupon Today

TRI-STATE COLLEGE

5111 College Avenue, Angola, Indiana

Please send me free catalog and special information. I am particularly interested in courses as checked.

☐ Mechanical ☐ Civil ☐ Electrical ☐ Chemical ☐ Aeronautical
☐ Radio (Television) ☐ Business Administration ☐ Accounting
☐ Short Diploma Courses

NAME.....
ADDRESS.....




U. S. GOV'T SURPLUS
"BARGAIN BOOK"

SAVE ON WINTER NEEDS!
It's loaded with bargains in genuine Gov't Surplus for farm-home-industry. Save up to 85% on clothing, hardware, sporting goods, etc. The "Book of the year". Send 10c for yours today.

500 BARGAINS
- FARMS - SPORTS
- HOME - SHOP

MAIL TODAY Only 10c

FISLER SALES CO.
723 WALNUT ST., DESK 511, KANSAS CITY, MO.



WARN HUB CAP MAKES 2 JEEPS OUT OF 1

Ends front wheel drag on 4-wheel drive Willys Station Wagons, Pick-ups and Jeeps

Saves gas up to 5 miles per gallon, tire wear, front axles, increases speed and power. Stops shimmy—front wheels coast out of gear! 4-wheel drive handles, performs, climbs like 2-wheel. Install or remove WARN HUB CAPS in 10 minutes. Polished aluminum, guaranteed. Rush check, M.O., or C.O.D. Write for circular.

\$20.00
Prepaid
U. S., Canada

WARN MFG. CO., - Dept. 5, 1625 3rd Ave., Seattle 1, Wash.

TREASURE -- \$10,000

New locator detects metals, valuable minerals and buried treasure. Money-back guarantee of superiority.

Also geiger counters. Govt. reward of \$10,000 for uranium discovery. Write for FREE information.

THE GOLDAK COMPANY
1544 W. GLENOAKS BLVD., GLENDALE 1, CALIF.



ILLUSTRATED CARTOON BOOKLETS!

BSAY, FELLOWS! BE THE LIFE OF THE PARTY WITH THESE SMALL ILLUSTRATED CARTOON BOOKLETS OF COMIC CHARACTERS \$10, ALL DIFFERENT, \$1 POSTPAID \$5 SORRY, NO POSTAL C.O.D.'S!

REGINALD SALES
210 L Fifth Ave., New York, N. Y.

**BUY U. S.
SAVINGS BONDS**

FOAM RUBBER

FOR HOBBYISTS, CRAFTSMEN, EXPERIMENTERS





Lowest Prices—SAVE 50%

16 x 16 x 1 1/2" .. ea. \$1.35	AUTO SEAT TOPPER PADS
16 x 22 x 1 1/2" .. ea. 1.75	Place under seat cover
18 x 24 x 1 1/2" .. ea. 2.00	24" x 60" x 1 1/2" .. ea. \$6.45
24 x 24 x 1 1/2" .. ea. 2.95	24" x 60" x 2" .. ea. 7.95
	12" x 14" x 1 1/2" .. ea. 1.25

Use for furniture cushion fillers, mattresses, Mattress pads, cushions. Available in any size, or thickness or shape. Send For Free Price List. Immediate delivery. No C.O.D.'s. Add 10% for Postage & Handling to Above Prices. Please print.

RIOR RUBBER COMPANY, Dept. SP-11
50 East 22nd St. Chicago 16, Ill.



FULLY GUARANTEED TIRES COST LESS!

Nationally famous FIRESTONE, GOOD-RICH, U.S. ROYAL, GOODYEAR, and other makes. Every tire selected and inspected for your safety.

NEW TREAD TIRES GUAR. 24 MOS. (Mud & Snow Tires \$2. Extra)											
550x16	9.98	600x16 (6)	11.98	650x16 (8)	21.95	700x16 (6)	16.48	750x16 (8)	12.48	800x16 (10)	14.98
550x17	9.98	650x15	11.98	640x15	10.98	710x15	12.48	760x15	13.98	820x15	14.98
600x15	9.98	650x16	12.48	670x15	11.98	760x15	13.98	820x15	14.98		
600x16	9.98	650x16 (6)	14.48	700x15	13.48	820x15	14.98				

GOOD TIRES GUARANTEED 12 MONTHS											
600x16	4.14	700x16	5.14	32x6 (8)	8.84	825x20	14.24	900x20	13.3	1000x20	14.14
650x16	4.54	670x15	4.74	32x6 (10)	10.84	900x20	13.3	1000x20	14.14		
650x15	4.34	650x20	7.84	750x20 (8)	8.54	1000x20	14.14				
700x15	4.64	700x20 (8)	8.94	750x20 (10)	9.94						

AAA PREMIUM GRADE GUARANTEED 18 MONTHS											
600x16	5.58	700x16 (6)	7.98	600x20	9.78	825x20	18.68	900x20	18.98	1000x20	19.98
600x16 (6)	6.58	750x16 (6)	8.98	650x20	10.88	900x20	18.98	1000x20	19.98		
650x16	5.98	820x15	7.48	700x20	12.88	1000x20	19.98				
650x16 (6)	6.98	710x15	6.48	32x6 (8)	10.48	1000x22	21.98				
650x15	5.98	550x18	5.98	32x6 (10)	12.48	100x22	20.98				
700x15	6.68	760x15	6.78	750x20 (8)	12.98	100x22	21.98				
700x16	6.78	550x17	5.88	750x20 (10)	14.98	1100x24	23.98				

MILITARY SPECIAL						MILITARY					
AA Guaranteed 12 Months—						New Tread Guar. 24 Mos.					
900x16 11.98 900x20 19.98						600x16 10.98					
750x20 12.89 1100x20 21.98						600x16 (6) 11.98					
AAA GUARANTEED 18 MONTHS						750x20 (8) 26.98					
900x16 14.98 750x20 16.48											
Passenger Tubes—Water Tested—All Sizes... \$1.25											
Truck Tubes—Water Tested—All Sizes... \$2.95											

Largest stock of used tires in the East. Thousands of satisfied customers. Write for sizes not listed. MONEY ORDER OR CHECK WITH ORDER. NO C.O.D.'s

PYRAMID TIRE CO.
1333-35 North 5th St.
Dept. M., Phila. 22, Pa.

HANGOVER BLUES
Nausea, Upset Stomach, Headaches

FEEL GREAT... IN A JIFFY!
STADE works four ways. Overcomes Alcoholic Depression, Absorbs Gases and Toxins, Reduces Gastric Hyperacidity, Relieves Pain. Doctors' tests prove STADE is safe, effective and contains no laxatives. Sold on Money Back Guarantee. At your dealer or send today.

UNITED PHARMACAL PRODUCTS, INC.
Dept. A-11, 176 W. Adams, Chicago 3
Canada: 36 Yonge St., Toronto 1, Ont.

SEND NO MONEY
Just name and address on postal. Pay Mailman \$1.00 plus postage. Or send \$1.00 now and we pay postage.

Free Book

Money In Hamsters
The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories use thousands. Clean, odorless. Raise anywhere. NOW, spotted and golden breeds. We furnish breeders, equipment and manual of instructions. Write today for free illustrated literature.

GULF HAMSTERY 1540 BASIL ST., MOBILE 17, ALA.

MAGIC-SCREEN INCOME PLAN OFFERS BIG MONEY, AT HOME, SPARE OR FULL TIME

Reproduce any painting, design, trade-mark, picture, printing, in full color, on any surface! Proven new method enables you to cash in on established business where Profits up to \$5.00 or more an hour are being made, right now! Examine complete Plan and equipment without risk!

Write today for free sample - Complete free details! **Send NOW!**

CALIF. ACADEMY OF SCREEN PROCESS Dept. 111 5100 SO. VERMONT AVE., LOS ANGELES 37, CALIF.

★ **GET ON "UNCLE SAM'S" PAYROLL** ★

START AS HIGH AS \$3,450.00 A YEAR

MEN — WOMEN

REARMAMENT PROGRAM CREATING THOUSANDS OF ADDITIONAL JOBS!

Mail Clerks and Carriers, Rural Carriers, Stenographer-Typists, Clerks, Messengers, and many others.

32-page book on Civil Service FREE

Mail Coupon TODAY ACT NOW

FRANKLIN INSTITUTE (Not Government Controlled)
Dept. B-80, Rochester 4, N. Y.

Sirs: Rush to me, without charge, copy of 32-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

Name.....

Street.....

City..... Age?.....

LEARN.. "CERAMIZING"

THE NEW HOME ART HOBBY
TURNING WORTHLESS OBJECTS
into VALUABLE TREASURES

\$5 AN HOUR PROFIT
Creating Things of Beauty



Amazing Book Tells You
How to do the work—what to decorate—what materials you need—where to buy them cheaply—how to get customers coming—what to charge—how to start a business in spare time without risking job or paycheck that can lead to future independence. You read all this without risking any money at all. Just send name.

Think of learning an artistic hobby in just a few minutes of instruction. Think of turning just 56c worth of material into an art object so beautiful that it brings you \$5.00 an hour for your spare time. Sounds fantastic—yet it's true—as you can easily prove without risking a cent of money. I have ready to mail to you a complete set of instructions so easy to follow that a child can learn this fascinating new art. Within an hour you can be "Ceramizing." The very first day you can create things of beauty from Nature's countless masterpieces of design, such as leaves, flowers, twigs, stones and shells. Preserve and beautify keepsakes such as Baby Shoes—turn 10 cent store products into art objects worth five to ten times their cost—restore and rebekutify hundreds of household articles for yourself and friends.

FREE Pay Me Nothing for this Information
This fascinating home hobby is used by many as a means of steady extra income. Fun for the whole family—and money besides. Read the entire plan—all instructions—at my risk. **DON'T SEND MONEY—JUST YOUR NAME FOR COMPLETE DETAILS FREE.** Address **R. E. Brandell, WARNER ELECTRIC, 1512 JARVIS AVE., DEPT. 211, CHICAGO 26, ILL.**

R. E. Brandell, WARNER ELECTRIC, Dept. 211
1512 Jarvis Ave., Chicago 26, Illinois

Please rush complete facts showing how I can start "Ceramizing" business at home for pleasure or profit. No charge. No obligation. All FREE.

NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....

LAW FREE BOOK

Your FREE copy of "The Law-Trained Man" shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 17-volume Law Library written by 65 well-known law authorities. Lawyers, judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.

BLACKSTONE COLLEGE OF LAW Dept. 128, Chicago 1, ILL.
225 N. Michigan Ave.

A Correspondence Institution Founded in 1890

THIS HANDBOOK FOR AMBITIOUS MEN FREE!



Have you had your copy?

150 pages of guidance to best-paid positions. Up-to-the-minute information for men who want to climb to the top. Tells how to get promotion, security and better pay through home study courses. This handbook "Engineering Opportunities" is free and entirely without obligation. Send the coupon. Make this your big year! Describes over ninety courses including:

Mechanical Eng.
Aeronautical
Television
Building

Electrical
Radio
Automobile
A.M.I.Mech.E.

A.F.R.Ae.S.
A.M.I.C.E.
B.S. (Pure
Science)

--- SEND COUPON TODAY ---

Canadian Institute of Science & Technology Limited, 530 Century Building, 412, 5th Street, N.W., Washington, D.C.

Please forward free of cost or obligation your handbook, "ENGINEERING OPPORTUNITIES".

Name.....

Address.....

Course interested in..... Age.....

Canadian enquiries: 263 Adelaide St. W., Toronto 1

MAKE \$5 PER HOUR

PRINTING

WITHOUT A PRINTING PRESS

REVOLUTIONARY
NEW SCREEN METHOD

PRINT colorful signs, posters, banners, fabrics, wall paper, show cards—ANYTHING! Print on any surface. NO printing press or special equipment is needed with this amazing "approved" new printing secret. 300% profit on nearly every job. Easy to learn — NO EXPERIENCE or art ability necessary. Exceptional opportunity. Complete illustrated detailed plan and color sample FREE—Write

SCREEN-PRINT COMPANY, Dept. 111
1010 So. Los Angeles St., Los Angeles 15, Calif.

FREE
complete "BIG MONEY"
Plan and
SAMPLE!



EARN
AT HOME
SPARE or
FULL Time

PAINT STRIPING TOOL

Works Like a Fountain Pen
Stripes with PAINT instead of INK!

New Master Painters' STRIPING TOOL makes it easy to do expert striping on furniture, bikes, model planes, autos, signs, linoleum, toys, wall board, etc. Makes plain, painted walls look like tile. Paint straight lines, curved, circular or evenly spaced parallel lines the same way a professional painter does. Simply fill Tubular Glass Paint Fountain with any color paint & wheel tip feeds paint evenly. Tips interchangeable — jaws split apart for easy cleaning. Tool complete with tip for 1-16 in. stripe only \$1 postpaid. Other complete tools with 1-64, 1-32, 3-64, 1-16, 5-64, 3-32, 1-8 in. tips, \$1.50 ea. Extra tips, 75c. Complete kit with tool and 7 tips, \$5.00. Handiest tool in painter's kit. Get it now. C.O.D.'s postage collect.

WENDELL MFG. CO.

4234 N. Lincoln Avenue
Dept. 211 Chicago 18, Illinois
Paints Curved, Circular or
Straight Lines



Tubular
Glass
Paint
Fountain

A Visible
Paint
Supply

POST
PAID

DEALERS
Paint
Striping Tool

Packed in attractive Display Cartons of one dozen. Fast, profitable seller. Write for illustrated circular, discounts.

Thumb and Finger Rests.
Easy to Guide Tool

Guide Keeps Lines Straight
Knurled Wheel Distributes Paint

ELECTRIFY your SEWING MACHINE



NEW LOW PRICE!

\$11.50

1 YR.
GUARANTEE

Buy direct from manufacturer and save! Kit comes fully wired, installed in a jiffy. Fits all machines! You get all these new parts!

- Motor & Bracket
- AC-DC 115v 60c
- Multi-speed foot control
- Cord set & block
- Easy instructions
- Steel pulley & belt

FREE, reg. \$2.95 Chrome SEWLITE given with kit.
10 DAY FREE TRIAL—ORDER NOW!

Send no money, pay C.O.D. or send money order and we'll pay postage. Please state whether wheel on your machine turns toward you or away from you. Shipping wt. 6 lbs.

SENIOR SEWING MACHINE CO.

1046 Bedford Avenue Dept. P5-31 Brooklyn 5, N. Y.

Opportunity OF A LIFETIME!

SELL AIR CUSHION SHOES



Write for FREE catalog today!

Build a permanent "repeat business of your own" without one penny of investment! Spare time pays big money! Sell John Neil Air-Cushion Shoes Direct from famous New England factory. Firestone Foamex cushions — complete line of men's dress, work, safety shoes! DuPont Neoprene non-marking soles, Women's and children's shoes. Fast deliveries from our mammoth stock department.

Earn up to \$30.00 per day!

JOHN NEIL SHOE CO.
Dept. 751 - Brockton 64, Mass.



FREE—Amazing Book on RHEUMATISM, ARTHRITIS

If you suffer the aches, pains and discomforts of Rheumatism, as manifested in ARTHRITIS, NEURITIS, SCIATICA or LUMBAGO, send today for the FREE Book. It reveals important facts about why drugs and medicine give only temporary relief without removing causes. Explains fully a proven, specialized system of treatment that may save you years of distress. No obligation. Write for this FREE Book today!

BALL CLINIC, Dept. 36, Excelsior Springs, Mo.

BE A HIGH-PAID MAN IN YOUR COMMUNITY WITH THIS LONG NEEDED INVENTION

Earn up to \$10,000 or more per year!
Nothing to invest! Be your own boss!

U.S. Pat.
D 153853-
D 153854

A worldwide product needed by every home, business and farm...priced to sell quickly! Automatic Red Comet goes into action as soon as fire starts... smothers fire without human aid. It's a sales 'natural'!

FREE SALES KIT

Demonstrator units, sales literature, etc., furnished you FREE. Handsome leather-type kit. Tried and proved, it will make you an independent businessman. ACT NOW! Someone in your community will be appointed soon. Write for details, today!

RED COMET, INC.

Dept. 48-A, R. C. Bldg., Littleton, Colo.



SW-54 \$49⁹⁵



Amazing broadcast and shortwave radio by the makers of professional radio equipment for the

KON-TIKI

expedition of book and movie fame

COVERS THE RADIO WORLD!

Covers all frequencies (broadcast, police, ships, aircraft, amateur) between 540 kcs. and 30 mcs. Uses new miniature tubes for maximum sensitivity. Precision-built. Measures only 11" x 7" x 7"



Yes, a radio receiver and transmitter built by National, world's most respected maker of professional radio equipment, kept the famed Kon-Tiki Expedition in touch with civilization despite storms, salt spray and even total immersion! Now, at modest cost, you can enjoy a broadcast and shortwave radio with the same rugged, built-in dependability!

Write for name of nearest supplier.

National



NATIONAL COMPANY, Inc.
MALDEN, MASSACHUSETTS

\$300.00
A WEEK FOR YOU
ON ONLY 5 ORDERS
A DAY!

Now—for Millions of Homes!

TEMP-O-MATIC

Amazing Electric "Brain"
URNS HEAT DOWN
at NIGHT—UP in MORNING
AUTOMATICALLY!



The big-profit opportunity of a lifetime! TEMP-O-MATIC, new "wonder-invention" thermostat control that turns heat DOWN at night and UP in the morning—AUTOMATICALLY! No more remembering—or forgetting—to turn thermostat down at bedtime. No more getting up in a cold house to turn heat up in morning. TEMP-O-MATIC does BOTH—AUTOMATICALLY! Attached in a jiffy to most any type thermostat. Returns its amazing LOW COST first season in fuel savings alone!

Sure-Fire FREE TRIAL SALES PLAN!

Thousands of homes in your territory will say "Yes" when you say "Try TEMP-O-MATIC FREE"—and 8 out of 10 won't let you take it out! Only 5 sales a day can pay you \$300.00 a week cash profit! Act NOW to be first in your territory with TEMP-O-MATIC! Rush your name and address on the coupon below for full details. Don't wait! Mail the coupon NOW!

TEMP-O-MATIC, Dept. B-302, 6 N. Michigan Ave., Chicago 2, Ill.

TEMP-O-MATIC, Dept. B-302
6 N. Michigan Ave., Chicago 2, Ill.

Please rush "Via Air Mail" complete details about TEMP-O-MATIC and about your sensational FREE TRIAL Sales Plan.

Name.....
Address.....
City..... State.....

GROW Living MIDGET TREES!

EARN \$10.00 PER HOUR!

- AT HOME
- IN SPARE TIME
- NO EXPERIENCE NEEDED



It's new! Amazing! At last, the secret of growing miniature (MING) trees can be yours. FULL GROWN, dwarf trees—only a few inches high. Beautiful miniature fir, orange, oak, Chinese elm, peach, pine, cypress—any kind! ALL BLOOM and even BEAR FRUIT. All perfect healthy specimens—but miniature in size! Make costly home decorations and expensive centerpieces. (SOLD FOR OVER \$1,500 EACH) Big demand. Costs only pennies—takes only minutes per week. IT'S EASY! Fun! A new fascinating hobby—a new fabulous \$\$\$\$ business. Send for free secret plan details and real seed.

HELP US FILL HUGE DEMAND!

These trees are being demanded by STORES CLUBS • HOTELS • FLORISTS • HOUSEWIVES • INTERIOR DECORATORS • COLLECTORS • HOBBYISTS—A Big Money Opportunity FOR YOU.

FREE! GENUINE SEED AND PLAN!

NATIONAL NURSERIES, Dept. N11
8620 South Ruthelen Avenue
Los Angeles 47, California
Rush me FREE plan and seed IMMEDIATELY!

Name.....
Address..... Zone.....
City..... State.....



Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in January issue, copy should be in our office by November 26. No cancellations accepted after November 15.

CLASSIFIED OPPORTUNITIES

POPULAR SCIENCE MONTHLY-351 FOURTH AVE.-NEW YORK CITY 10

1 AUTOMOBILES & MIDGET CARS

BUY racing heads, dual manifolds, Hot coils, etc. without money. Information free. Newhouse Automotive Industries, Los Angeles 22.

BIGGEST "Speed Equipment Catalog" in world! Save, order direct—Hollywood Mufflers, \$4.95, Dual Mufflers, \$18.95, Cut Outs \$6.95, Dual Intake Manifolds \$12.95, Racing Cams \$29, Hi-Compression Heads \$26.95, Water Injectors \$6.95, Customizing Kits \$1.98, Chrome Accessories at discounts! Catalog plus "Hot Rod Handbook"—25c. Almquist Engineering, Milford 54Z, Penna. (Dealers Wanted.)

NON-Profit organization offers literature—old, new and foreign automobiles; Shop manuals, engineering papers, data books, glossy photos, free motor magazines. Contact auto nuts everywhere. Write today; get name on free mailing list. Auto Maniacs, Inc., Stockbridge, Mich.

CHEVROLET Speed Manual 1937-51 Chevrolets, G.M.C.'s, Buicks! Equipment Catalog included! Satisfaction guaranteed! How to Build 120MPH road jobs, track, boat engines. \$2.00 postpaid, California Bill, 6199 N. Figueroa, Los Angeles 42, Calif.

SAVE—California Custom Accessories headquarters. Buy direct from original designers. Chrome dash panels, electric push button door-trunk conversions, fender skirts, dual mufflers, lowering kits, speed-dress up equipment. 40 page catalog. Hundreds of photos—25c. Eastern Auto, 3319D South Grand, Los Angeles 7, Calif.

"WATER Injection." Also—Economy—Power—Methods. Free illustrated information. Neher Industries, La Verne 6, Calif.

S-P-E-E-D & Mileage Manual—Get lightning acceleration—up to 100% more power and mileage from any car! Famous Soup-Up Book shows how to build Speed Equipment, Dual Manifolds, Hot Cams, Compression Heads, Superchargers, Racers, Fast Conversions, Stock Cars, California Roadsters! Covers "Souping," Speed Tuning, Racing Tricks, Fuel Formulas, Ratios, Porting, Stroking, Lowering, Economy Information, Speed Shop Methods, "California Customizing"—all cars! 300 Photographs! Drawings! "Restyling Plans!"—Plus "Hot Rod Handbook," Catalog, Racer Emblem, Tuning Chart and Gas Saver Folio—Six Items \$1.98. Almquist Engineering, Milford 51Z, Pennsylvania. (See ad page 35.)

MAKE Ford use Diesel fuel \$1.00 for plans. Refiner, Box 292, Columbus, Nebr.

MOTORISTS—Save gas with proven automatic alcohol-water injector! Only \$5.95! Free literature. Vaporizer Company, Box 7033R, Los Angeles 37, California.

WIGLESWORTH-Chasteen's Automobile History Scrapbook, 160 pages. Old time pictures and advertisements of automobiles from 1899 to 1934. \$1.50. Deluxe binding \$3.50. Wiglesworth-Chasteen, 7134-PS Alhambra, Mission, Kansas.

NEWHOUSE makes another sensational offer. See page 32. Don't miss it.

2 AUTO SUPPLIES & EQUIPMENT

NEW and used guaranteed parts for civilian and Army cars and trucks. Largest stock in America. Mail orders. Pioneer Auto Wrecking Company, 788 W. 13th Avenue, Denver, Colorado.

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Avenue K, Decatur, Illinois.

\$3.00 WILL give you a better car. La-Chapelle's 100,000 miles Treatment. (Patented) Puts bearings on the pistons. Ferns, 8120-D Walnut Dr., Los Angeles 1, Calif. (Ask for Data.)

FOR free descriptive literature on alcohol-water injection for cars—trucks—tractors write Shade, Webster, New York.

1951 EDITION. It's new. It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts and accessories for all cars and trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. Send 25c (refundable). J. C. Whitney, 1919-T Archer, Chicago 16.

"HOW to buy speed equipment without money." No selling. Information free. Newhouse Automotive Industries, Los Angeles 22.

AUTO Bed—Convert your car into a single or double bed when needed. Works on 2 or 4 door sedans, club coupes and convertibles. Send \$1.00 for complete plans. Auto Bed Company, 305 East Sixth Street, Panama City, Florida.

WOLF Whistle Auto Horn no holes to drill \$3.00 prepaid. Charter Oak, 256 145th Avenue, St. Petersburg 6, Florida.

SEND for free Life Membership Card. "Water Burners of America, La Verne, California.

MOTORIST save gasoline by Vacu-mating overrich mixtures. Fits all cars. For Free particulars write Vacuumatic, Dept. 1816, Wauwatosa, Wisconsin.

NEW white latex coating makes black tires look like expensive white walls. Brushes on. Tremendous demand. 150% profit. Rubber Products, Dept. 44, New Haven, Conn.

RACING & Hot Rod Equipment Lowest Prices Anywhere—Power Handbook plus catalog—25c. Almquist Engineering, Milford 55Z, Penna. (Dealers Wanted.)

CHEVROLET owners replace your own connecting rods in one hour save \$. New tool price \$2.65. H. R. Harman Tool Works, Vernon, Michigan.

ILLUMINATED Hubcaps. Complete plans show you how to install lighted hubcaps. Creates rings of light any color or size—car, bus or truck safer to drive nights, especially in rain or fog. Prevent accidents at dark intersections. Become "Enlightened." Mail \$1.00 to Franklin Enterprise, 464 North Madison Ave., Los Angeles 4, Calif.

CHAMOIS Best quality Imported. Seamless, soft, pliable, absorbent, durable. Perfect for polishing glass, autos, furniture. 16"x17" \$1.85. 18"x25" \$2.60 plus 15c postage. Babrok, 5 State, Troy, New York.

DUAL Points "49-51" Ford Merc. Eliminates Faulty single points. Easily installed. Longer dwell, only \$6.95 prepaid. Milt "Red" McQuade, Dept. AR, 3002 C. V. Blvd., Castro Valley, Calif.

SAVE Gas! Save oil! Save repair dollars! Proven guaranteed product only \$3.95. Free folder. Advanced Engineering, Box 7013K, Los Angeles 37, Calif.

FROM Speedway To Roadway! Track-proved Hi-Speed Heads and Manifolds for your passenger car! No special tools needed! Increase Horsepower 30%! Astounding Getaway! Illustrated Catalog. (Dealers Wanted). Speedsport, 4866-C Milwaukee, Chicago 30.

3 AUTO TRAILERS

BUILD your own trailer! Plans for all kinds. Illustrated catalog 10c. Jim Dandy, 125-S, Wausau, Wisconsin.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

WHIZZER in Schwinn bike \$20; good motorscooter (twist grips) \$22.50; midget car \$15; Shaw bicycle motor \$15. Send 25c (35c first class mail) for catalog #19 jammed with other sensational bargains in wheels, motors, clutches, motorscooters, midget cars, motorettes, motorbikes, etc. Gail, 538 Erie, Toledo, Ohio.

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 1, Mo.

MIDGET Car \$10. Motorbike \$7. Safety-cycle, \$15 less engines; Whizzer motor \$6; Smith motorwheel \$10; Evinrude outboard motor \$8. Four airplane type tires \$3 (mailorder only). Send 25c for new catalogue Number 43, just out listing these and hundreds of other bargains in new and used midget cars, motorscooters, home-builders parts, plans, engines, transmissions, war surplus, etc. (35c by First Class Mail.) Midget Motors Directory, Athens, O.

MOTORCYCLE Magazine—Worldwide Coverage. Yearly Subscription \$2.00. Sample 20c. Motorcycle News, 5424-B Sawyer, Chicago 25.

REBUILT Gasoline Engines. \$17.00 to \$37.00. Cauffiel Motor Industries, Temperance, Michigan.

5 AVIATION

FREE 168 page illustrated catalogue of aviation products. Complete bonded warehouse stocks. Write AMC Supply, P. O. Box 1440-S, Fort Worth, Texas.

BULLET Raceplane. Homebuilt, Speedy Monoplane. Blueprints \$2.00. Corbcraft, 80-S Elmerston, Rochester, N. Y.

HELICOPTERS—Blueprints—Construction Kits—Flying Models. State and county distributors wanted. Catalog and information. \$1.00. Refunded first order. Aero-Tech, 601 Jefferson Street, Montgomery, Ala.

6 BATTERIES, GENERATORS, ETC.

EDISON Non-Acid Storage Batteries. Amazing long life. Any voltage. 37 to 600 ampere hour sizes. Lighting Plants, Generators, Motors. Literature. Hawley Smith Co., Croton Falls 2, New York.

7 ELECTRICAL SUPPLIES & EQUIPMENT

LAMPS—Had trouble finding repair parts? Your search is ended. 25c brings 64 page illustrated catalog containing wiring charts. Gyro Lamps, 5402B Clark, Chicago 40, Illinois.

TELEPHONES—Telephone Wire. Low-Cost Army Field Telephones will solve your communication problems. Simply string wire, connect phones, ring and talk any distance. Free illustrated folder. Loris Sales, Dept. 1, 907 2nd St., Sacramento, Calif.

LAMPS—Build own Originals. Parts Wholesale, any amounts. Catalogue 10c. Brown Lamp Co., No. 501, Wellston, St. Louis 12, Mo.

8 WELDING, SOLDERING

NEW Booklet—"The Secret of Welding Aluminum." Make money! Send 50c in coin. Larson Aero Development, Box 758, Concord, Calif.

A.C. Welders. 4 Sizes. Lowest Prices. Free literature. Holgerson's Service, Canton, Kansas.

9 MACHINERY, TOOL SUPPLIES, ETC.

TIGER Tractor. America's Finest 6 HP riding tractor. Pulls 4 tons. 10 inch plow—All big tractor features. Free literature. Tiger Tractor, 70 East St. Keyser, W. Va.

HIGH-Speed Steel Rotary Files. new, 1/4" shank, 6 assorted \$5.00. 13-\$10.00. Free catalog shop tool bargains. Colman Tools, Box 364, Amarillo, Texas.

FREE Literature! Build your workshop projects with guaranteed American Power Tools. Bandsaws, Circle Saws, Sanders. Latest design—features. Save dollars on new catalog special! Write today. American Tools, 412 Irving North, Minneapolis 5, Minnesota.

FREE Catalog. Full line hobby and light industrial power wood working tools. Guaranteed. Dealers wanted. Backus Machine Co., Chippewa Falls, Wisconsin.

POWER tools, equipment wholesale prices. Free Bulletin. Homecrafters Co-operative, Grand Rapids 6, Michigan.

DRILL Grinder for twist drills. \$2.95. See ad on page 272.

FILES, Hold-Fast File; rough sample (secret), \$1, postpaid. Free leaflet, "Noah's Ark Echo." MacGregor, Box 744, Newtown, Bucks County, Penna.

DRILL Glass like experts. Satisfaction guaranteed. 3/8" Franite drill \$1.50 postpaid. Fran Studios, Box 11333, Fort Worth, Texas.

INDEX Heads for the lathe, drill-press, milling machine, etc. Very reasonable. Write for free folder. Long's Index Heads, Box 537, Torrington, Wyo.

CIRCLE Cutting Attachment for 14" Delta Band Saw. Cut circles from 2" to 36". \$5.00 postpaid. Inquire for other make band saws. Arthur Gibbons, 3632 Chelton Road, Shaker Heights 20, Ohio.

10 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors, single and three phase, \$1.00. Motor Data, Box 7631, Kansas City 3, Mo.

REBUILT Gasoline Engines, \$17.00 to \$37.00. Cauffiel Motor Industries, Temperance, Michigan.

HOTTEST surplus list in the country. Electronics, Hydraulics, Aircraft, Gadgets. Dick Rose, Everett, Washington.

MOTOR Winders, free bulletins. Winding and testing equipment. Motor Industries, Quincy, Illinois.

11 BOATS, OUTBOARD MOTORS

STEERING Wheels, windshield brackets, from \$6.95. Modern fittings "Water Skis," at lowest prices. Complete pre-cut plywood boats. Bargains galore. Folder 10c. Marine, Box 681, Mendota, Minnesota.

FASTEST Boats In The World—Build Now. Complete plans available for sleek Three Point Racing Hydroplanes. Runabout and others. Send 25c now for new illustrated catalogue. Champion Boats, Box 9038, Dept. 23-K, Long Beach, Calif.

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

FULL size, cut to shape boat patterns, blueprints, 7 1/2-38 feet. Illustrated "Build a Boat" catalog 25c (coin). "How to Build Boats" book, \$1.00. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland 13, Ohio.

OUTBOARD Motor Parts—New—Used for all makes. Send stamp for price quotation. Outboard Motor Mart, Inc., 309D Atlantic Ave., Boston 10, Mass.

SAVE 2/3 cost. Assemble your own boat. We furnish parts. No experience necessary. Rowboats, Cruisers. Illustrated Catalog 25c. Midwest Boat Company, Menomonee Falls 1, Wisconsin.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N. J.

FORD and Jeep marine conversion catalogue 25c. Oscomotors, 3627F Lawrence, Phila. 40.

CURE that leaking boat with Fiberglas—Plastic covering. Ends caulking and painting. Nationally approved process. Easily applied, complete instructions. Industrial Plastics, 3807 Harrison Street, Oakland 11, Calif.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (Over 200 illustrated pictures.) Expert instructions—Three volumes Complete \$2.25. Variety House, Box 46-A Wall Station, New York 5.

100 TRICK Knockouts for self defense. \$1. 1c each. Priest, Box 251, Evanston 2, Ill.

BARBELLS, Dumbbells, Exercise equipment. Courses. Free booklet, Good Barbell Co., Reading, Penna.

13 TAXIDERM

TAXIDERM Supplies. Books. Instructions. Everything! Catalog 10c. Vandyke's, Wessington Springs 13, South Dakota.

14 FIELD GLASSES, TELESCOPES

POWERFUL astronomical telescopes easily made. Perfect lenses and instructions; 100x \$3.00; 100x and 200x \$4.00; 100x, 200x and 400x \$6.00. Full power, clear vision guaranteed. Instructions alone 10c. Suffolk Science Service, Riverhead, N. Y.

"FREE" Catalogue! Thousand war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send \$1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 93-08—95th Avenue, Ozone Park 16, N. Y.

BIGGER and better telescope kits with metal parts direct from manufacturer. Free Bulletins. Esco Products, 911 Willow Ave., Hoboken, New Jersey.

SAVE 50% On New Binoculars! Free Catalog. Free book, "How to Select Binoculars." Write today! Bushnell's, 43-P211 Green, Pasadena 1, California.

WAR Surplus Bargains. Binoculars, Telescopes, Sextants, Millions of Lenses, Prisms, Reticles, Eyepieces, Objectives, etc. Mail 10c for Big "Catalog CN." Send \$1.00 for Stock CN-10-piece Lens Kit and Big Instruction Booklet. Edmund Scientific Corp., Barrington, New Jersey.

BINOCULARS, telescopes, microscopes. Our 20th year of leadership in optical values. Bargain catalog free. Brownscope Co., 24 West 45th St., New York.

AMAZING prices, brand new precision binoculars, \$16.00 up. Free trial. Folder "Binocular Selecting," pricelist free. Prentiss Importers, Mercury Bldg., West Los Angeles 25, Calif.

FREE 20-page Binocular Catalog. Over 60 different models. United, Dept. ARF-4916, 9043 S. Western, Chicago 20.

ONE 6" refractor telescope with finder-scope, revolving eyepieces 35-75-300 power. Esco Products, 911 Willow Ave., Hoboken, New Jersey.

GIANT, 100 power astronomical telescope with 6 ft. tripod (10,000 area magnification) Clear Vision full power guaranteed. \$15.00 F. O. B. factory. Suffolk Science Services, Dept. TC, Riverhead, N. Y.

REFLECTING Telescopes, completely assembled, 60X, \$25.00. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

ASTRONOMICAL Telescopes, binoculars, microscopes; bought, sold, repaired. Books, lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

BINOCULARS completely repaired. Send glasses or write for estimate. Gould Lens Service, 26P Franklin Ave., Binghamton, New York.

ALUMINIZED telescope mirrors 3"-12" diameters. Eyepieces—Prisms—Tubing. 50X-400X Astronomical Telescope Lens Kit \$3.00. Powerful 200X-1,000X Pocket Microscope \$3.00—300X magnification only \$1.00. Postcard brings Plans—lists. Pfeiffer Optical Co., PS-11, Sunbury, Penna.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

120 PROFUSELY illustrated pages, antique and modern pistols, swords, daggers, armor, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

CAST Iron Molds—for making your own sinkers. Write for free illustrated booklet. Reading Instrument Co., Box 78, Reading, Pennsylvania.

LEARN Gunsmithing! Details, copy "Guns and Gunsmithing," 25c. Gunsmith's Service, 3118 Montrose, Chicago 18, Ill.

CALLS, records, and decoys for duck, crow and goose hunters. Free catalog. Oscar Quam, 3149-39 Avenue South, Minneapolis, Minn.

AMMUNITION, American-Foreign and Obsolete. New guns. Dime for list. Central Sports, Delphos 25, Ohio.

SEND 8c for my 350 gun list. Helke, Wenona 45, Illinois.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

SEND 10c for lists either rifles, handguns, shotguns, ammunition. Or send 25c for all lists. Frayseth's, Willmar, Minn.

MOLDS "For fishermen, sinker, squids, jigs, and lures" handled and hinged, quality fishing tackle, free catalogue. Sweets Molds, Tonawanda, New York, Box 163.

ANTIQUE, Modern Guns, Bargain list 10c. Martin Rywell, Harriman, Tennessee.

ANTIQUE handguns popularly priced. Beginners or general collectors list 10c. Hi-Fulton Gun Corner, 413 South High, Columbus 15, Ohio.

AUTOMATIC Fishing Reel—something new. Fish from pole, dock, boat, limb, ice fishing, set out as many as you like. \$1.25 apiece. 6 or more \$1.00 apiece. C. A. Williamson, P. O. Box 284, Henderson, Ky.

OVER 500 guns, modern, obsolete. List 10c coin. Ed Howe, 26 main, Coopers Mills, Maine.

\$1.00 BRINGS non-technical bulletin on gold prospecting. James Black, Box 203-A, LaHonda, Calif.

ATTENTION Hunters—Farmers—Shooters 1,000 excellent deer—varmint guns from \$16.50—List 25c. Agramonte, 201 Warburton, Yonkers 2A, New York.

17 DOGS, BIRDS, HAMSTERS, & PETS

SEE Gulf Hamstery ad on Page 73. Shows picture of Hamster.

EARN Up To \$400 Monthly Raising Angora or New Zealand Rabbits. Plenty markets. Particulars free. White's Rabbitry, Newark 35, Ohio.

MAKE Big Money! Raise Chinchilla Rabbits. Cash Markets Supplied. Write Today! Rockhill Ranch, Sellersville 16, Pa.

RAISE Mink! Free booklet, pen plans, inside "secrets" feed care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

RAISE Guinea Pigs. Markets guaranteed. Booklet free. Taylors, B426B, Hapeville, Ga.

THE New Panda Hamster, write for price and details. Fred Battersby, 430 N. 4th St., Vineland, New Jersey.

FERRETS \$8.00 each. Chase rats, rabbits. George Wirtz, Cologne 10, Minnesota.

MAKE big money raising Rabbits for our cash market. 16 page illustrated booklet, Market News Letter, etc., 10c (Refundable). Old Mill Rabbit Farm, R. 1, Elmhurst 4, Illinois.

LOVELY golden cream Great Dane puppies—Loving companion. —Guard, 36 West 1st No. St. Salt Lake City, Utah.

18 FROG RAISING

AVAILABLE for delivery. Famous Lee Domesticated Bullfrog breeders, \$18.00 per pr. Yearlings \$12.00 per doz. F.O.B. Instructions on care & feeding of these frogs. Live delivery guaranteed. Send check or Money order. Lee's Frog Hatchery, Box 24, Casitas Springs, Calif.

19 FARMS, OTHER REAL ESTATE

GOOD Farms—Ranches, Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable Crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minnesota.

OZARK Lands for all purposes. Actual river frontages, 5 acres \$90.00 and upwards. Free list and literature. Hubbard, 424-H, Minnesota Ave., Kansas City 1, Kan.

NEW Farm & Business Catalog Free! Just out! Maine to Florida . . . Bargains from \$1,000 . . . up! West's, 9-G, Pittsburgh 17, Penna.

FLORIDA, New Lake County development adjoining Ocala National Forest. Best fishing, hunting. Safe from bombs. Nice homesites \$245 at \$10 monthly. Folder free. Winfree Vernor, DeLand, Florida.

NEW Free Winter Catalog just off press! Farm and country real estate bargains, good pictures, many states, easy terms, many equipped businesses. For Special Service, state requirements, desired location. United Farm Agency, 2825-PS Main St., Kansas City 8, Mo.

FLORIDA Homesites—\$145. Pay \$10 monthly. Large, beautifully wooded Tracts, high and dry, in delightful Panama City Pleasure Resort Area. World's finest Beaches. Lovely Lakes. Best fishing, hunting. Enjoy life every day in this glorious climate and desirable Community. Low taxes—low building costs—low living costs make this ideal Place for your Vacation Lodge or Retirement Home. You get Most for Your money here. Booklet Free. Douglas Wood, Box 873, Houston, Texas.

STROUT'S Fall Catalogs. East and Mid-West Red cover; West Coast edition Blue. Farms, Homes, Businesses, bargains galore. Either Mailed Free. Strout Realty, 255-ZB 4th Ave., New York 10, N.Y.

CHEAP Homes, farms, in beautiful, healthful, fertile, lovely Ozarks. Abundant free stock range. Free literature, listings. Write, Barnsley, Clarksville, Arkansas.

FLORIDA—5 acres high dry land only \$245.00. \$10 down \$10 month; full information. Write G. B. Potterfield, Dept. A, Charleston, West Virginia.

21 POULTRY & SUPPLIES

POULTRY Farmers—Broiler growers—Turkey raisers read the new American Poultry Journal for latest ideas and greater profits. 12 months, 50c. Special offer, 4 years, \$1.00. American Poultry Journal, 525 South Clark, Chicago.

RAISE pheasants on the \$100 week plan. Little capital and space can make you independent. Free details. Great Central Game Management System. Columbus 6, Kansas.

22 PROFITABLE OCCUPATIONS

BE independent, be secure, have your own profitable business—earn \$20.00 and more a day making beautiful, fast-selling lamps at home. No equipment needed. Illustrated course teaches you quickly. Course, parts catalog, wholesale price list—only \$2. Gearon Co., Dept. 200-A11, 27 S. Desplaines, Chicago 6, Ill.

FREE book "How to Make Money With Home Workshop" describes amazing methods used by hundreds of successful craftsmen. Tells what to make. How to sell workshop output spare time. Write at once for details. Remember it's free! Craftsman, 115-G11, Worth St., New York City.

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

\$5000 FROM half acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

\$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331.583, free spawn. North American, 169Y Yonge, Toronto, Canada.

WANT a Diesel Job? Our approved, up-to-the-minute Diesel Training Program can help you qualify for steady, big pay jobs or specialized military training. Covers Diesel, Tractor, Heavy Equipment. Easy to master. No loss of present income. Job Placement Advisory Service. Investigate! Write for information today. Interstate Training Service, Dept. 2M, Portland 13, Oregon.

PRINT Without A Printing Press. Big Money! See page 74.

WANT Money? Enjoyable pastime, Hobby. Free information. These Hobbies, 9320-R San Juan Avenue, South Gate, Calif.

EARN \$4 to \$10 an hour in Your spare time. Qualify for exciting, fast-growing field of Claims Adjusting. Free Book—Now! Write Universal Schools, P-101, Box 8202, Dallas 5, Texas.

FREE Book "505 Odd, Successful Businesses." Work home! Expect "Odd"! Pacific-64B, Oceanside, Calif.

23 BOOKS & MAGAZINES

MAGAZINES (back dated)—foreign, domestic, arts, Books, booklets, subscriptions, etc. Catalog 10c. (refunded). Clacerone's, 86-22 Northern Blvd., Jackson Heights, N. Y.

BOOKHUNTERS! Scarce, unusual, miscellaneous books supplied. Atlantic Book Service, 2 Lawrence, Charlestown 29, Mass.

PIN Ups. Breathtaking Beauties! 68 Large photos \$1.25. Giant Edition 132 Photos in Plastic Portfolio \$3.00. A must for all photo collectors. Special Gift with \$3.00 order. Rarepix, Box 11535, Los Angeles 48, California.

WE serve libraries and dealers. Why not you? The Magazine Barn, Dept. 1, Box 193, Seattle, Wash.

POCKET Novels. Used, 8 for \$1.00. Free List. Trunkat, Glenshaw 3, Penna.

NEED a gift? Literature. Sample free. Box 48, Brooklyn 25, New York.

FREE List Self-Unfoldment Books. "The Mysteries". Yoga, Occultism, Philosophy, Theosophy, Freemasonry. Jordan, 1130 Keller Avenue, Louisville 13, Kentucky.

BOOKS—Government surplus. Text-books, including International Correspondence School's Home Study Pamphlets. One half Million volumes, Bargain prices. Free catalog. Long's College Book Co., Dept. PS, Columbus 1, Ohio.

BARGAINS: Good used books, 85c. Write for list. Gallard, 29P Coe Ave., Hillside, New Jersey.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 630-K East 178 Street, New York 57.

ADULT Books—Illustrated Comic Booklets, 12 for \$1.00, 24 for \$2.00. All Different. Free gift with each \$2.00 order. V. M. Rogers, Dept. PS, Box 14738, Cimarron Station, Los Angeles 18, Calif.

JUMBO Humor Package—24 Real illustrated gag books only \$1.00 with Fascinating catalog. Aladdin Book Co., 210T Fifth Ave., New York 10.

HYPNOTISM simplified! Complete monolog, instructions. "You Can Hypnotize" \$1.00. Hypnotism, 1978 Dartmouth Avenue, Columbus 3, Ohio.

FREE Adult Books. Send Stamp for Details. Paul Vallon, 63 Perry, New York 14, N. Y.

WANTED—Thousands of used books to exchange for ours. Write for details. Read's Book Exchange, 2117-2 Front St., San Diego 1, California.

HARD-TO-FIND Books supplied. Send wants. Pierce's, Winthrop, Iowa.

FIFTY different mail order publications—\$1.00. Stevens, 716 West Fourth, Michigan City, Indiana.

BACK-date Magazines. Specific issues; years. Arkell's, Tarzana 2, Calif.

STRANGE Stories! Sample and illustrated literature, 25c. Exchange, Fitchburg 23, Mass.

JOHN Skane. New & Used books, magazines & correspondence courses. Rent or trade. Elizabethtown, Penna.

24 GAMES & ENTERTAINMENT

TRO-Lo—Game, entertaining, educational, \$1.29 each, postpaid. Request free picture-card. B. E. Norvell, Cornville, Arizona.

ADULT novelties asst. \$5.00 express. Tupler, 216 W. Jackson, Chicago.

QUIZ—Bingo, Globe-Rummy, Triple-Deal, Madam-X. Four complete games including Playing cards, \$1.00 postpaid, P.O. Box 842, Denver 1, Colorado.

25 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS' Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo.

WE supply every noted magician. Large professional catalog \$1.00. Holden's, P220 West 42nd Street, New York.

"VENTRILLO," Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia.

LATEST Magic for pocket, parlor, stage. Catalogue 500 Tricks, only 10c. Unequaled magic service for 30 years. Douglas Magicland, Dept. 2, Dallas, Texas.

200 ELECTRIC stunts \$1.00. Cards \$1.00. Cutting Sons, Los Altos, Calif.

FREE Trick and catalog only 5c. Furr, Box 1882-H, Norfolk, Va.

FREE trick and large illustrated catalog—35c. Lerro's Magic, 509 80th Street, Brooklyn 9, N. Y.

BE a Magician. Large professional magic catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago.

MAGIC Monthly, Year 25c. Sample and Magic Catalogue free. Magic Shop, Minneapolis 2, Minn.

TRICKS, funmakers, novelties, gigantic selection 10c. Andersen's, 6815S Ardmore, Chicago 31.

GUARANTEED hypnotism lessons. Complete course now only 50c. Was \$1.95. Box 186, Perth Amboy, New Jersey.

512-PAGE catalogue of 2500 tricks, pocket, parlor, stage. World's Finest Magic. Send \$1.50 for catalogue (refunded first \$6.00 order). Kanter's, S-1311 Walnut, Philadelphia 7.

26 COIN COLLECTING

FOREIGN money, two wooden nickels, and "Coin Collector's" new magazine, 10c. Lawrence Brothers, Anamosa, Iowa.

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 51 years.

OLD Money Wanted. Do you know that Coin Collections pay up to \$100.00 for certain U. S. Cents? And high premiums for all rare coins? We buy all kinds. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

FIFTY assorted Indian cents, \$1.50. Rare 1931-S cent, \$1.00. Giant 52 page illustrated bargain catalog, 10c. Ben's PS Department, 31 North Clark, Chicago 2.

WE Pay \$5 to \$500 Each For hundreds odd-old U.S. & foreign coins. Keep all until posted. Send 20c for Ill's Coin Value Book 4x6 with bargain list free. 44 years in business. Coin Exchange-1, Le Roy, N. Y.

COMMEMORATIVE \$1½ — Columbus, Washington, Cleveland, Stone Mountain, \$2.00 ea. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

BARGAINS! 400 assorted 1859 to 1900 Indianhead cents \$15.00—30 different \$2.00—large cent before 1857, 1890 cent, 1909 VDB cent, 2c piece, Liberty-head nickel, 1913 nickel. Foreign coin and Complete Buying—Selling catalogue \$1.00—half dollars 1826 to 1838 \$2.00—large cents 1826 to 1856 50c—Catalogue 25c. Worthycoin Corporation, D-416, Boston 8, Mass.

12 INDIANHEADS 50c; 4—2c pieces \$1.00; 10 Large Cents \$3.75; 5—3c Nickels \$1.00; Bargain list 10c. Fairway Company, Rye, New York.

GENERAL MacArthur Set (2) \$3.75. Vatican Holy Year Set (4) \$1.00. 1932-D Quarter \$1.00. 1932-S Quarter \$1.00. 256 Page Retail Guidebook \$1.50. Premium Handbook \$1.00. Giant bargain catalogue 25c. Bebee's, 1180 East 63rd, Chicago 37, Ill.

28 STAMP COLLECTING

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Milton Skinner, 438 Locust, Long Beach 12, Calif.

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

AMAZING Offer! 500 United States stamps—including commemoratives, airmails, high values to \$5.00—Only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

COLUMBIANS. Trans-Mississippi, Pan-Americans, Pan-Pacific, ten other different commemoratives. All 10c with your request for US approvals. Mada Stamps, Box 251-V, C.S.A., New York 8.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retail for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

"HOW To Recognize Rare Stamps." Free Book Illustrated! Kenmore, Richford H-58, Vermont.

WOW! 203 All Different Germany 10c! Zeppelins, Semipostals, Airmails, High Values, etc. to new customers. Jamestown Stamp, Jamestown 509, New York.

500 EXOTIC Japan Stamps—10c! Kenmore, Richford J-58, Vermont.

FREE—Complete set of Famous Americans, Flags, Parks and Presidentials to approval buyers. Send 3c for 15 of the above stamps plus full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 211, New York 38, N. Y.

FREE—Illustrated Catalog! Kenmore, Richford C-58, Vermont.

750 FRANCE and colonies stamps 10c. Littleton Stamp Co., Littleton 26, N. H.

U. S. COLLECTORS—write today for free material. Eagle Stamp Co., 2221-B Romine, Pittsburgh 26, Pa.

500 STAMPS For Only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange countries cataloguing up to 25c each!! Also approvals. Mystic Stamp Company, Camden 55, New York.

FREE Big United States Catalog Invaluable guide and check list. Hundreds of illustrations. Harrisco, Boston 17-B, Mass.

FREE! Powerful Magnifying Glass. Jamestown Stamp, Jamestown 202, N. Y.

77 DIFFERENT United States—25c. Approvals. Utechts. 1143-A North Keeler, Chicago 51.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps. 1435 E. 67th Place, Chicago 37.

1050 DIFFERENT Stamps given to approval applicants becoming customers. Send 3c for particulars. Lists and approvals. Bryson Stamp Company, Drawer F-30, Rossford, Ohio.

ROOSEVELTS complete, plus 25 other U. S., 10c with United States approvals. Locust, Box 305-A, Harmon-on-Hudson, New York.

WE Give Away—Your Choice Latest Scotts Albums; Catalogue and available philatelic accessories. Realize—You Get These Worthwhile Rewards When You Buy From Our Better Foreign Approvals. Write Today For Full Particulars Sent With Trial Approval Selection. Americas' Stamp Service, Riverside 2, Calif.

POLAR Bear Triangle; Giant George Washington Six Colored Ecuador, Arctic Triangle, first American commemorative, Corsica, Devils Island, others. Everything free with approvals. Capital Stamps, Little Rock 10, Ark.

POUND mixtures. U. S. or Foreign. \$1.00. Book Nook, Willmar 61, Minnesota.

MAGNIFICENT! Nineteenth Century U. S. Plus Civil And Spanish War Revenues. 20 Different, 10c To Approval Applicants. AAA Stamp Company, Arcade Building, St. Louis 1, Missouri.

UNITED States stamps! Cheap! Catalogs. Sullivan, 115-D Endicott, St. Paul 1, Minn.

PAYING High prices for approvals? If your collection numbers under 15,000 try our 1c and 2c approvals. In books of 1000 different. Lots to choose from at lowest prices. Also special offer to customers. Clark, Box 544U, Muskegon, Michigan.

FREE! Tiny Chinese "Midget" War set. Approvals. Seminole, North Miami, Fla.

CLUB Journal with special kind of type now out, 25c issue. \$1.50 yearly. Herold, 42-09 77 Street, Elmhurst 73, New York.

FREE. Scott's International Album. Other big premiums. Full particulars with approvals. Raymax, 123-X William St., New York City 38.

FREE famous American set (21) with 100 different large U.S. Commemoratives for dollar (currency) with U.S. or British approvals. Gables Stamp Studio, Box 985-S, Coral Gables, Florida.

312 MIXED U.S. only 10c to "Gold Nugget" approval applicants! Nothing like them. Kessel's Palsom, Calif.

RED Russia—28 all different—5c. Approvals. Mitchell, Box 923K, Portland, Maine.

SCARCE Nicaragua, Roosevelt, Madagascar, Turkey, Martinique, Ecuador, Somali Coast, Cuba, Mints, Send 3c. Silas Stamps, Box 55-V, Triborough, New York 35, N.Y.

1/10 CATALOGUE while our supply lasts on many over stocked foreign stamps. Try them on approval. Premiums on purchases. Roseland Stamp Co., Dept. 9-E, Spring Lake, Michigan.

NEED a gift? Literature. Sample free. Box 48, Brooklyn 25, New York.

100 DIFFERENT U.S. old-new 25c lists. Weatherby, Medina, Ohio.

50,000 STAMP Grabags 25c each. Anderson, 630a Bingham, Reading, Pa.

PENNY Approval Bargains!—Write Dept. PSM, 1267 Tutwiler, Memphis 7, Tenn.

PENNY Approvals by country, M. H. Hoerning, 102, Farmington, Ark.

50 DIFFERENT U. S., 10c. No Approvals. Seidenberg, 944, Appleton, Wis.

FREE! Big Illustrated Catalog listing everything for the Stamp Collector. Harrisco, 204 Transit Bldg., Boston 17, Mass.

OLD scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

WORLDWIDE Stamps. All Different. 1050—\$1.00; 2000—\$2.50; 5000—\$12.50. Bargain Lists Free. Beacon Sales, Maynard 3, Mass.

100 DIFFERENT U. S. 25c. Approvals. Buckeye, Box 53, Mansfield, Ohio.

FREE odd shaped stamps to buyers of our foreign approvals. Plus an Amazing Surprise Offer. "Stamps". Santa Ana, Calif.

FREE "Stamp Finder." Tells instantly country to which any stamp belongs. 32 pages profusely illustrated. Garcelon, Calais 18, Maine.

FREE: Mint British Colonies from Niue, Gilbert Ellice, Nauru, Turks Caicos, Brunei, Caymans, Tonga, Pitcairns, Sarawak—Free with approvals. Viking, 130-P Clinton St., Brooklyn, New York.

UNITED States and foreign approvals. Profit sharing plan. Seminole Stamps, Box 1138-S, Coral Gables 34, Florida.

U.S. Price List free. Petter Wetterquist, 1635-13th Ave., Rockford, Illinois.

DIFFERENT. 25 Canada, 25 U.S., 25 Switzerland. All 3c. Approvals. Aletalo, Maynard, Mass.

BAHAWALPUR Silver Jubilee mint set free to applicants of U.S. or British Colonial approvals. Alan Taylor, College Point, Winter Park, Florida.

MOZAMBIQUE Co! 20 different pictorials! Only 20c to approval applicants. Star Stamps, Jamestown, New York.

FREE! "What's My Name?" Fascinating Illustrated quiz booklet. Barrels of fun for everyone; Valuable prizes for correct answers. This Booklet absolutely Free! Send to-day. Approvals! Stamp Quiz, Calais, 618, Maine.

BARGAIN! 100 different United States stamps—including commemoratives, airmails. Only 10c to approval applicants. Sunset Stamp, Dept. 300, Box 47, South Gate, California.

50 BRITISH Empire 10c approvals. C. Smith, Box 6618 Northeast, Kansas City, Mo.

ITALIAN Africa Pictorials worth 55c. Free to approval buyers. Pleasure Stamps, 1865A 52nd Street, Brooklyn 4, New York.

FIRST U. S. (1847) Government Revenues 5c, 10c, plus Giant Bargain U. S. Collection—only 5c to applicants U. S. approvals. Metropolitan, Box 312K, Jackson Heights, N. Y.

UNITED States stamps nearly 100 years old. Roosevelt set, others, 40c value—only 6c to applicants United States approvals. Wakonda, Box 272-H, Jackson Heights, N. Y.

WONDERFUL Offer 7 complete mint sets Manchukuo, Bohemia, etc. only 10c. with approvals. Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill., Dept. S23.

PHILIPPINES—25 different only 10c. Colorful 2c approvals. Moffet, 921 College, Rock Hill 3, South Carolina.

500 STAMP hinges and 25 different Canada 3c with approvals. Jaydee, 218 Dickinson S.W., Grand Rapids 7, Michigan.

TASMANIA, Thailand, Israel, Victoria, free with approvals. A-to-Z Stampco, Box 36, Miami Beach 39, Florida.

515 MIXED worldwide and unused set—10c to approval applicants. Wethly, 15 Stegman Court, Jersey City 5, New Jersey.

PENNY approvals by countries. Also net. Miracle Stamps, Miracle Hot Springs 3, Calif.

1,000 WORLDWIDE diff. \$1.00. 2,000—\$2.00. C & G Stamp Service, 419 S. University, Albuquerque, N. Mexico.

SPORTS—pictorials—5 sets only 5c. Approvals. Wirth, Norwichtown 1, Conn.

FREE!! Amazing "Queer Countries" Packet—with approvals! Saxon, Vista, California.

343 DIFFERENT—43 countries 25c. Approvals. Cs. Reitter, Box 1505, Detroit 31, Michigan.

FIFTY different United States; commemoratives, dues, etc. All for 10c. Ed Keller, Library 2, Penna.

FREE Collection—over 100 different stamps of world—commemoratives, animals, natives, ships, famous men, others all to approval buyers; also Scott Albums. Catalogs. Bell Stamp Service, Dept. W-3, Bell, California.

1,000 MIXED U. S. and foreign 25c. Monjar, Fairmount, Cincinnati 14, Ohio.

FREE! "Carnival" Packet of midget, giant other "freak" stamps—yours with bargainful, temptingly-different approvals. Niagara Stamp Company, 22 Queensway, Niagara-on-the-Lake, Canada.

307 ALL Different—Only 15c! Beautiful collection: Commemoratives. Triangles. High Values. Bicolored Stamps, etc. Garcelon, Calais 418, Maine.

FREE U. S. and Confederate States catalog. Stone, 45-S Bromfield, Boston 8, Massachusetts.

GERMANY B218-29. Warplanes, destroyers, Paratroopers, Machinegunners; free with approvals. William Deems, Ravenswood, West Virginia.

FREE Sample—Interesting, Informative. Enjoyable. National Stamp News. Anderson 2, South Carolina.

FLAG Stamp—Free with hygrade U. S. approvals. Wenigman's, 1933 Patterson, Chicago 13.

ALBUM! Holds 2000 stamps! Only 10c! Glamore Company, Manchester 1, Conn.

GOYA Nude—3c with approvals! Stearns, 1249-c Griswold, Detroit 26, Michigan.

FINE Quality foreign mission mixture. Large variety. Plenty good finds! (over 5000 stamps). 2 pounds, \$3.50. Halay, 132-R West 63rd, New York 23.

FREE Album! Commemoratives!—to buyers from our famous penny approvals. Complete details accompany trial selection. Orana, Box 1775, Santa Ana 22, Calif.

U. S. Mixture—75 Commemoratives. Airmails. High Values. \$1.00! Satisfaction guaranteed! Approvals if requested. Wunigman, 1933 Patterson, Chicago 13.

NUDES Set and colorful approvals—10c! Atlas, 2830-P Eisenhower, Racine, Wisc.

APPROVALS, unusual foreign stamps. Complete sets, Singles, Ward, 241 South Winchester, Campbell, Calif.

100 NETHERLANDS, all different. Beautiful assortment, 10c with approvals. Thomsen's, Box 4074-S, Miami, Florida.

CANADA Scarce 1950 set 10c with attractive approvals. Rheume, 6591 11th Ave., Montreal, Canada.

THOUSANDS of stamps you will never see unless you order approvals steady. May I help you? Sophus Jenssen, Coupeville, Washington.

1039 DIFFERENT 50c—Approvals and Illustrated lists—Klondike, Harrisburg, Ill.

APPROVALS 1/2c up from 33,000 collection. Chur, Box 245, Buffalo 12, New York.

EGYPT #240—Pound value cataloging \$2.00—25c with approvals. Royal Stamp Company, Tamaqua 2, Penna.

PERSONALIZED Approvals. British Colonies—Latin America. Valuable gift to applicants. Larry Kittinger, Winter Park, Florida.

10,000 DIFFERENT 1c each! Gordon Davison, Box 1019, Manchester, N. H.

CLOSE-OUT! 100 foreign-mounted (catalogues over \$7.00)—\$2.00. Unmounted—\$1.75 Limited! Holladay, Box 8292 (U.T.), Knoxville, Tennessee.

51 KOREA and Japan 10c; Approvals: Chase, 152 Court Street, Portsmouth, N.H.

LAUGH at Inflation! Thousands of fine stamps just 1c-2c! Send references for book of 1000. Niagara Stamp Company, 21 Queensway, Niagara-on-the-Lake, Canada.

29 ANTIQUES, RELICS & INDIAN GOODS

4 FINE ancient Indian arrowheads \$1.00. Fine stone tomahawks \$2.00, \$3.00. List free. Lear's, Glenwood, Arkansas.

GET Catalog #17—Selling 500 Historical Firearms, 20,000 Indian Relics, Coins, Collectors Cartridges—Revolutionary, Civil War, Indianwar Muskets, Flintlocks, Rifles, Pistols, Swords, Bayonets, Ramrods, Bulletmolds, Percussion Caps, Powderhorns, Arrowheads, Wampum, Tomahawks, Spearheads, Gempoints, Discoidals, Agates, Minerals, Fossils, Marine Shells, Mounted Pheasants, Deerheads, Owls, Quail, Squirrels, Steerhorns, Blo-horns, Bo-wood, Violin Wood, Buffalo-horns, Kentucky Rifles, Winchester, Gold Dollars, Carbines, Profusely illustrated catalog 35c. Heike, Wenona 40, Illinois.

SPECIAL: 10 Indianheads, \$.68—Civilwar Bayonet \$1.98—Civilwar Sword \$8.88—Deerhead \$28.50—Civilwar Musket \$28.50—10 Arrowheads \$1.88—Tomahawk \$3.45—Scalping Knife \$1.87—Agate, Pyrite, Molybdenum, Fossil, Geode, Gempoint, Crinoid, Blastoid, Gastropod, each \$.48. Heike, Wenona 40, Ill.

30 MINERALS & PRECIOUS STONES

"GENUINE" red Arizona Rubies (Garnets). Send quarter for packet. Bitner's, Box 1025-C, Scottsdale, Arizona.

GEMS, Precious and semi-precious, all genuine, from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7-K, Salem, Oregon.

GEMCUTTING, Silvercraft authority. Illustrated magazine tells how. Cut rocks, make jewelry. 150 ads illustrating equipment, offering gems for collectors, cutters. Postal brings literature. Lapidary Journal, Drawer D, Palm Desert, Calif.

WANT to cut gems? Get "Art of Gem Cutting" 128 pages. Explains everything. \$2.10. O'Brien's, 1116 N. Wilcox, Hollywood 38, Calif.

GEMSTONES. Mineral specimens. Every variety. Lowest prices. Postcard brings free booklet. Plummer's, 2183D Bacon, San Diego 7, Calif.

RUTILE-Titania: New synthetic gem. More brilliant than a diamond. Write today for illustrated literature. Marsam Jewelers, 607-E South Vermont, Los Angeles 5, Calif.

AGATES, Jade, Gems, free list. North West Gem Shop, Box 305, Tacoma 1, Wash.

31 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 631-E St., N. W., Washington 6, D.C.

SHIP Model Catalog. Kits, fittings. 160 pages. Money-Back Coupon—50c. Antique Cars, vehicle catalog 15c. Polks, 314-PS Fifth Ave., New York 1, N. Y.

50 DIFFERENT army embroidered patches \$1. Other bargains. Insignia Mart, 703B Broadway, N. Y. C. 3.

EAST coast marine shells. 1951 edition 1,000 illustration, descriptions. \$6.00. Maxwell Smith, Windermere, Florida.

BUTTERFLIES beautiful Tropical 20 different specimens \$2.00. American Butterfly, 3706 Rosedale Rd., Baltimore 15, Md.

UNUSED matchbook covers—100 different \$1.00—36 page Catalog 25c—Charles Edelman, 1311P East 84, Cleveland 3, Ohio.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

24 GLOSSY photos \$1.00. (6 sets 144 photos \$5.00). Beautiful models, all different, glamorous poses, the kind you will like. Catalog 50c, none free. Nutrix Co., Dept. D-51, 212 East 14th St., New York 3, N. Y.

FILMS, highest quality, rapid service, eight enlarged prints, 50c. "Camera," Box #280, West Chester, Penna.

CHRISTMAS cards from your negative, 18 for \$1.00. Send 10c extra for postage and packing. Your eight exposure roll with three prints each good negative 50c. Reprints 3c. Eastman Studio, Bode, Iowa.

PHOTO Xmas cards 15 for \$1.00. Techni-Foto, Lorain, Ohio, Dept. PS.

8 CONTACTS 30c, jumbos—40c, 12—45c. Jumbos—55c, reprints—4c, jumbos—5c. Free mailers. Western Photo PS11, Box 298, San Francisco 1, Calif.

"MIAMI Look"—Have your color transparencies put into our telescopes. Excellent gifts, 4 for \$1.00. G B Sales, 18 Vernon Ave., Brooklyn 6, New York.

33 MOTION PICTURES, SLIDES SOUND EQUIPMENT

MOVIE Camera Film: 8mm roll \$1.50, 16mm 100' \$3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

GUARANTEED Fresh 8mm roll, magazine; 16mm roll, magazine movie film. Color, b&w. Free catalog. Eso-S, 47th Holly, Kansas City 2, Missouri.

8-16MM, Silent-sound films. Complete rental library. All latest subjects. Free catalogue, (sample film 10c). Garden Film, 317 West 50th, New York 19.

UNUSUAL 8-16MM, Movies, Full-color projection length sample, \$1.00. Color Tru-Art Slides, three samples \$1.00. Big catalog, 25c (refundable). National Film Supply, Toledo 9-E, Ohio.

RENT 16MM sound films 50c reel. Large selection; free catalog. U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

ADD "Spice" to home projection shows with colorful old-time Nickelodeon slides. 2x2. Write for Free list. Nickelodeon Co., New Fleidner Bldg., Portland 5, Oregon.

ALMOST Free—with your request for Blackhawk's big 24-page catalog of film bargains—One brand new film, postpaid. (We select the title)—100' 16MM sound 98c; or 100' 16MM silent 59c; or 50' 8MM, 39c—as a special get acquainted offer. Other typical Blackhawk bargains: New 1-reel 16MM sound films \$7.95 (formerly \$17.50); new 1-reel 16MM silents \$2.98 (formerly \$8.75); new 1-reel 8MM \$1.89 (formerly \$5.50)—all first quality prints in original cartons. Used Panoram 100' 16MM musicals—\$8.89 per dozen. Similar bargains in used features, cartoons, sports, comedies, musicals, travels. Used sound projectors—Ampros, Bell & Howells. Victors—often available low as \$129.95. Bargains in reels, cans, supplies. World's biggest stock 16MM films—over 100,000 prints. Write today for Blackhawk's free catalog and get acquainted offer. "Sixteen's Super Market," Blackhawk Films Inc., 1104 Putnam Building, Davenport, Iowa.

WE develop enlargement from movie frames. Sterling Camera, Bridgeport, Indiana.

NEW and used sound film for sale at less than cost. Soundies, shorts, features. Send for listing. Dept. PM, Lawrence Camera Shop, Box 1597, Wichita, Kansas.

SOUND equipment, amplifiers, phonographs, recorders, etc., custom designed for you. Information on request. Rohrer Sound, 624 4th Street, N.W., Canton 3, Ohio.

HOLLYWOOD Models 8mm and 16mm silent. Sound. Kodachrome. Films Free Catalogue. Fine Arts Film Co., P. O. Box 2084, San Antonio 6, Texas.

ART Film, Slides, Free list, Samples \$1.00. Price Brothers, 64-C West Randolph, Chicago.

BOOKS—Booklets—Novelties. Illustrated comic booklets 10 \$1.00. Catalogues 10c. Kogan, 1032-PS Church Annex, New York 8.

5,000 NEW-Used 8-16mm, Silent-Sound Films. International, 2120 Strauss, Brooklyn 12, New York.

THE World's Greatest Story. "Entire Life of Christ" 8mm, 16mm, Sound & Silent. Rent or Purchase. Hemenway Film, 33-W Melrose Street, Boston 16, Mass.

KODACHROMES of Western Parks on approval. See them—Choose them. Douglas Whiteside, Yosemite, Calif.

34 CAMERAS, PHOTO SUPPLIES

FREE Photographic Bargain Book packed with hundreds of sensational values in still and movie cameras, lenses and latest accessories. Super savings for you in new and used equipment. Liberal trade-in allowances, too, on your equipment. Write now for your free copy to Central Camera Company, Dept. 2-M, 230 S. Wabash Ave., Chicago 4 (Photographic Headquarters Since 1899).

BASS Says: Trading cameras a national habit since 1910. Write to Bass the old "Horse Trader." A postcard will do. Simply say: "Bass, I have and I want... How much will you allow me?" Satisfaction guaranteed. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for Free Booklet, American School of Photography, 835 Diversey Parkway, Dept. 1746, Chicago 14.

100-WATT Slide Projector only \$5.00 postpaid. Factory sale, discontinued model. Guaranteed. VuAid Inc., Ann Arbor, Mich.

KINE Exakta V, f3.5 CZT, case, never used, \$148. Free catalog, 1001 bargains. Dealers Mart, Dept. S-31, 11 Willard Ave., Mt. Vernon, New York.

BUY Photographic Supplies Wholesale. Films, cameras, projectors, enlargers, binoculars. Free catalog. Capitol Photo Supplies, 2428 Guadalupe, Austin, Texas.

PHOTOMURALS. Your negatives or ours. Catalogue 25c. Photomammoth, 12048 Vanowen St., North Hollywood, Calif.

35 MUSIC, INSTRUMENTS & SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted. Broadcast consideration. Sooner Song Co., 22 Northwest 8th, Oklahoma City 2.

POEMS Wanted for musical setting. Send poems for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston, Mass.

SONGWRITERS! Send poems, songs. Music Service, 243 West 72nd St., PS, New York 23.

SONGWRITERS! This is the Thing!! Free information. Trans-World Music Co., 6356 Hollywood Boulevard, Suite 230-4, Hollywood 28, Calif.

SONGWRITERS! Outstanding, ethical offer. Hibbler, C-15, 2157 N. Avers, Chicago 47.

ELECTRIC guitars, amplifiers, whole-sale. Free catalog. Carvin, PS, Baldwin Park, Calif.

WANTED—used records, 45's only. Write F-L, Box 19-B, New York City 35, N. Y.

SWISS musical revolving platforms. Catalog 10c. Bell Music, Box 49, Planetarium Station, New York 24, New York.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

MAKE simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

FREE! 212 Page Radio-Television-Electronic Catalog! World's largest stocks, lowest prices. Complete supplies for builders, experimenters, amateurs, servicemen. Latest radios, phonos, television, recorders, sound equipment. Thousands of parts, tubes, test instruments, books, diagrams. Top quality money saving values. Get yours now! Allied Radio Corp., 833 W. Jackson Blvd., Dept. 34-A, Chicago 7, Ill.

CRYSTAL Radio Experimenters. Write Leslie Hulet, R2, Lakewood, New Jersey.

AMATEUR Radio license preparation. Correspondence course. Low cost. Personal coaching. Federal Electronics Institute, 34 E. Putnam, Dept. A, Greenwich, Conn.

BUILDER'S "Pictorial Construction Plans". Free List. Alena, Box 24, Astoria 6, New York.

AMATEURS—Radio Engineering Questions answered \$1.00, with schematics \$2.50. Henry Twilman, Route #1, Chesterfield, Missouri.

24 PAGE Plans "20 Crystal Sets" (SW record 5,800 miles) 25c, including "Radio-builder," catalog. Laboratories, 1131-T Valota, Redwood City, Calif.

MAKE Distance-Getting crystal radio that works. Fully illustrated booklet fifteen cents. Money back guarantee. Francis, Box 5963, Cleveland, Ohio.

PRACTICAL, sensible, detailed fringe area instruction manual and tips—experience proven. \$1.00. Television Engineering Co., 303—34th Street, Bakersfield, Calif.

BUILD, repair radios, televisions, experience unnecessary. Start working immediately. Parts, tools, practical course. Fifteen dollars. Make good living. Free literature. Steg Electronics, Colchester, Conn.

37 BUSINESS OPPORTUNITIES

TO \$35.00 Weekly. Spare Time. Home Operated Mail Order Business. Successful small "beginner's" plan. Everything Supplied. Lynn, 5710-C Bankfield, Culver City, California.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-X Euclid, Cleveland 3, Ohio.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

FABULOUS Earnings—Fascinating pastime. Growing Genuine, living miniature (Ming) Trees. New sensational Business or Hobby. Astounding information free. Dwarf Gardens, Box 355H, Briggs Station, Los Angeles 48, Calif.

HOW and where to obtain Capital? Free details, Star Service, Wapakoneta, Ohio.

BIG money! Spare or full time in your home. No Selling! Spray New Miracle Finishes, Plush and Suede, on signs, radios, automobiles, figurines, lamps, toys, etc. Our business is booming. Help us fill huge demand. New easy Flok-Kraft methods. Material costs few pennies. You get dollars. Free samples, complete powerful money making plan free. Write now. Coast, 1002-P, Los Angeles St., Los Angeles 15.

RECAST old batteries into new. Latest achievements, Battery Laboratories, Minneapolis.

START a Venetian Blind Laundry. Profit opportunity for lifetime business. New machine method. Free booklet on request. P. D. Co., 442 N. Seneca St., Wichita 12, Kansas.

MAKE Money spare or full time casting Metal Toys and Novelties. Big wholesale and chain store demand for Autos, Soldiers, Ashtrays, Banks, etc. Keeps manufacturers busy. Production moulds furnished for up to 100 and more castings per hour. No experience or special place necessary. "Cash-in" on holiday orders now being placed. Write for information and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

TRAVEL Anywhere, Anytime. Earn \$50 up a week. Free details, Travel, La Grange 22, Indiana.

VENDING Machines earn big money! An investment as low as \$10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our Free catalog illustrating our nut, candy, gum and stamp vendors; also pin ball machines, music boxes, etc. Write immediately to: Parkway Machine Corporation, Dept. 9, 715 Ensor Street, Baltimore 2, Maryland.

MAKE Money At Home as renewal headquarters for all magazines. Big Christmas sales profits now. Liberal commissions. Supplies furnished. Write for Free catalog. McGregor Magazine Agency, Dept. 510B, Mount Morris, Ill.

SELL by mail; free details; instructive booklet 25c. Manhattan House, P.O. Box 51-L, St. Albans 12, New York.

BOOKKEEPERS. Operate simplified bookkeeping service CPA designed, double entry system. Instruction manual \$1.00. Kern, 4942A Vineland, North Hollywood, Calif.

CASH In! Make Reflective Nameplates and novelties. Easy. Big profits. Free samples. Highlight, 352-S Stewart, Turtle Creek, Penna.

POPCORN Equipment, Potato Chip Outfits. Long Eakins Company, 5163 High, Springfield 99, Ohio.

START Mailorder Bookshop—Everything furnished. 25c brings booklet, samples, exciting ideas. General Publications, Ossining 1, New York.

DOLLARS daily, writing. My way guaranteed. Details, ideas, booklet, rush 25c. F. Loeb, Cincinnati 36.

\$25 WEEKLY Working two hours daily. No canvassing. No manufacturing. Lycke, Box 2471-B, Cleveland 12, Ohio.

MAKE Perfumes At Home. Write. "Carey Laboratories", 1914 Chouteau PS-B11, St. Louis 3, Missouri.

PROFITABLE Home Mfg. Business. Make waterless hand cleaners, household & auto specialties, etc., by simply adding water to basic concentrates. Over 300% profit, up to \$500 monthly, on steady repeat orders. Formulas free Western G Aircraft, Los Angeles 19.

INVISIBLE Reweaving—big profits, big demand, easy-to-learn with low-cost complete course—nothing else to buy, ever. Details free, write today: Fabricon, Dept. K-4, 8342 S. Prairie Ave., Chicago 19, Ill.

\$10. HOUR! Possible! Home! Full or part time! With the world's most complete invisible reweaving instructions, and automatic latch steel tool assembly that makes moth holes, cuts, burns, tears in clothing disappear like magic including material for life \$3. Complete. (27 other unusual home projects) Satisfaction guaranteed. Details free. Walsh, Desk 7, 894 Main, Buffalo 2, New York.

ITEMS wanted for Mail Order Business, Oshrin, 8211 Tryon, Jamaica 3, New York.

NATURAL Molding Latex. Extra thick. Free sample. W. Wooley, 115B Donald, Peoria, Illinois.

LEARN Automotive Electricity, washers, refrigeration, house wiring, motors, cleaners, all appliances. Illustrated course. Tools furnished. Free Booklet. Pacific Trades, 7217 South Broadway, Los Angeles 3, Calif.

SCHOOL Students, are making \$3.30 an hour, Saturdays. Soliciting. Let us teach you, how to make more! Harry Walters, Mediapolis 1, Iowa.

PINBALL games, Shuffleboards, Punchboards. Webb Distributing, 4966 West Chicago Ave., Chicago 51, Ill.

EXTRA Money—No Selling—operate vendors. Amazing profits, details Free. Silver King, Suite 221, 622 Diversey, Chicago 14.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

BIG Money and fun growing Live Miniature Ming Trees on you window sill. Write for Free rare tree seed and plan. National Nurseries, 8620B Ruthelen, Los Angeles 47, Calif.

"YOU Phone Is Your Fortune." Tells how to turn your telephone into dollars. Complete \$1.00. Sale, Box 675, Richmond, Virginia.

WANTED! At Once! Home Producers by manufacturers in our Clearing House Service. Become a sub-contractor casting plastic products for these companies. Thousands of easy to make items required. Cash in at home, without previous experience. For details write Plastic Service Guild, Dept. PS, E. Boston 28, Mass.

TRADE Magazines Help You to success. Get latest copies through our Easy-to-Get-Acquainted Service. Hundreds of business, professional, craft, electrical, construction, health, motel, oil, travel, mail order, hobby, music, art, pets, photography, plastics, sports, television, selling, insurance, agricultural and others covering all interests. Send for list today. It's free. Commercial Engraving Publishing Company, 34S North Ritter, Indianapolis 19, Indiana.

MAKE flexible molds! Cast plaques, bookends, figurines! Free sample! H. Tooker, 630-A Chestnut, Hamilton, Ohio.

MOLDING Rubber, \$2.95 qt., \$9.95 gal. prepaid. Plastercraft Supply Co., 3051 St. Clair Ave., Cleveland 14, Ohio.

LEARN Sewing Machine Repair. Electricity, rent, trade, sell. Make "Big Money" at home, spare time. New motors, machines, etc., wholesale. Details free. Taylor Service Co., Hamilton PS-11, Ohio.

FREE illustrated course casting novelties genuine latex for molds. Major Chemical and Latex Co., 25 Allerton Street, Boston 19, Mass.

TIRED Of No Money, second rate jobs? Like to start a real career with a lifetime of high salaries? Write me about two growing fields that really need men. Ed. Howes, Chief, 456 W. Santa Barbara Avenue, Los Angeles 37.

QUICK Money! "Repairing Car Batteries!" At home! Easy, too! Batteryman, Grand Junction, Colorado.

YOUR own profitable home business. Preserve live flowers to last forever. Spare or full time. New discovery—simple—fascinating. No experience necessary. Send \$2.00 for working equipment. Instructions and valuable sales plans. Satisfaction guaranteed or money refunded. Herman, 210 Fifth Ave., Suite 1102, New York 10, N. Y.

ESTABLISH profitable automatic shoe shine route. Proven. Write Jiffy Shine, 1630 South Second Street, Phila. 48, Penna.

SUCCESS is yours in mail order selling. Let us set you up in a profitable mail order business of your own. Write for free details. Greenlawn Enterprises, 15378 Greenlawn, Detroit, Mich.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

MEN-Women—"Everybody likes Candy." Learn to make professionally at home. (Our 40th year.) Ragsdale Candies, East Orange, New Jersey.

MAKE Perfume at home—write "International", 6347 Parnell—PS-11, Chicago 21, Ill.

BOOKKEEPERS—Earn up to \$520 month serving small firms part or full time. Proved plan; simplified system. Particulars free. Tax Saver System, Dept. A, Ft. Worth 2, Texas.

MAKE Tough, durable plastic—1c pound. Makes attractive floors, walls, built-ins, roofs. Build good home. \$150.00 room. Bays Laboratory, Oklahoma City 9.

MAKE Money Addressing Envelopes. Our instructions tell how. Malco Company, 11-PS, Columbus 5, Ohio.

TIN-Cans. Turn them into cash. Nine methods. Instructions 50c. Charles Company, 12-CMB, Norwood, Ohio.

A Quick Money Maker. Earn \$12.00 a day easy, no selling. Send \$1.00 for complete information. C. Boster, Box 823, Appleton, Wisconsin.

MAKE Rubber Stamps, repair dolls, learn invisible reweaving, repair sewing machines. Catalogue of "40 Ideas." Universal, Box 1076-B, Peoria, Ill.

MONEY in new greaseless doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. S. Ray Co., 3605 South 15 Ave., Minneapolis 7, Minn.

OPERATE Profitable Mail Order Business. Write Mac's Service, 119 Vine, Shelbyville, Indiana.

ELECTROPLATE giftwares, jewelry, auto parts, mirrors. \$5.95 includes portable electroplater, plating salts, formulas, instruction manual. Tyco Metals, Box 13231-CC, Houston 19, Texas.

STOP wage slavery. New publication tells "Seven Ways To Start A Private Business Without Capital." Particulars free. Write. Reliance Business Service, 15B Park Row, New York 38, N. Y.

EXPORT—Import! Represent manufacturers! Conduct barter exchange. War-peace time big profit business. Buy-sell by mail operating at home. Let experts show you how. No previous experience needed. Get Free facts Now. International Trades, 246-S, Fifth Ave., New York 1.

EARTHWORMS—five special bulletins free. Wm. Barnard, 2121 Vanderbilt Lane, Redondo Beach, Calif.

EXPORT By Mail. Opportunity for home business or travel abroad. Free information. American Export Counselors, Box 569, Westport, Conn.

INCOME from local information. No selling. Write—Neherco, La Verne 6, Calif.

SPARE-Time office work in your own home for Men and Women. Free details. Business Publishing House, 127-N Broad St., Boston 10, Mass.

NICE income few minutes each day interesting. 25c coin for instructions. Box 245-A, Hartford City, Indiana.

OPERATE profitable mail order business. Splendid Opportunity. For details write Walter Bitterman, 133-B Boren Ave. N. Seattle 9, Washington.

MAKE Big Money at home with Magic Pearl Finish. Free plan. Pearl-Art, 7216 Bear, Bell, Calif.

FIGURINES unpainted, free illustrated list. Haverly Products, 822-A 17th Street, Altoona, Penna.

FREE Folio. 700 Money Making Deals. Plans, Formulas, Supply sources. Kolamite Company, Box 572, Dayton 1, Ohio.

GROW Mushrooms, Cellar, shed. Spare, full time. We pay \$3.00 pound. Free Book. Mushrooms, 2954 Admiral Way, Seattle, Washington.

FREE Booklet "How To Make Backyard Profits!" Pikett's, Florence, Kentucky.

HOMEWORK—Addressing envelopes. Details 25c. Siegal, Box 183-PS, New York 2.

QUICK Sign Painting. Use Letter Patterns. Avoid sloppy work, wasted time. Write for folder, John Rahn, B1330 Central Ave., Chicago 51.

OUR representatives make big money. So can you, at home. Spare or full time. No experience required. Write M. T. Associates, 26½ Potters Lane, Great Neck, N. Y.

\$49.50 STARTS you motion pictures as Operator-Exhibitor. \$5-\$50 day. Complete "plan—details—knowhow" \$2.00. Studio, 5259 Hollywood, Hollywood 27, Calif.

\$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-61B, Ocean-side, California.

"SEWING Machine Business Guide" covers service, sales, wholesale suppliers. New, complete, guaranteed, \$3.00 postpaid. Literature free. Century, 1321 Melbourne, Corpus Christi, Texas.

INVISIBLE Reweaving. Men-Women. Instructions shipped for no-risk examination. \$5.00 hour possible spare-full time. Reweave burns, tears, moth-holes like new at home. Free details. Skilweave, 1717-AR Westwood, Los Angeles 24.

COLLECT Cash without Selling! Every Business place a location for "Wishing Well". Free plan. Industries 23, Box 929, Long Beach 1, Calif.

\$10 HOUR, easy; home-grinding household tools, half price. No competition. Armfuls hand and circle saws; bags scissors, knives; hedgers, mowers, axes. Machine (30 lbs.) furnished. Hurry. Inventor, 3503-6 Chestnut, Baltimore 11, Maryland.

BUY Direct wholesale 750,000 articles. Directory 25c (refundable). Publishers, Box 1302-A11, Detroit 31.

EXTRA Dollars. Spinning angora wool for us. Angora House, PSM, Springfield, Ill.

\$46 FROM Square Foot Plywood; Jigsaw necessary. Write: Woodart, Bridgewater, Massachusetts.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

EARN Money At Home With Your Typewriter! Spare time! Details free. Edwards, Publisher, 3915-PS, 12th, Des Moines 13, Ia.

BUY it wholesale. Manufacturers. Distributors. Over 850,000 items. Literature free. Olsen, 1231-B East Third St., Duluth 5, Minnesota.

ADDRESS Envelopes. Postals, at home—longhand, typewriter. Particulars free! Carl Z. Torrey, Melrose 76, Mass.

QUICK cash, making (battery operated) fluorescent fixtures, handlights and lanterns. Use 50% discarded materials. Free details. Manhattan, Box 6, New York 35, N. Y.

GET The Newest-Best Home-Operated Mail Business offers. Small Capital, everything furnished. Free information. Write: Hickory Lane, E. Kingston, New Hampshire.

38 MONEYMAKING OPPORTUNITIES

QUICK profits taking magazine subscriptions, handling greeting cards. Cassell Publishers Service, Westfield, N. J.

DETECTIVES Earn Big Money. Experience unnecessary. Detective Particulars free. Wagoner, P-125 West 86th, N. Y. 24.

SCHOOL Seniors—Earn sensational profits selling classmates America's Most Beautiful Graduation Name Cards. Largest selection. Outsell all others. Free sample kit. Printcraft, Dept. P, 1425 E. Elm Street, Scranton 5, Penna.

BE Appointed State Notary Public Now! Details; Stationers, Helotes, Texas.

WATCHES, Elgin, Waltham, other outstanding brands. Expertly reconditioned, priced low for quick, great profits! Send for Free catalog. Plymouth Jewelry 163-P Canal St., New York 13.

BIG Profits. Make fast-seller chenille monkey trees, Christmas poinsettias, Santas. Literature free. Velva, Bohemia 17, N. Y.

\$10,800 PROFITS At Home! Lifetime Opportunity! Free advertising method builds your own Home Mailorder Business! Capital, experience unnecessary. Start spare time. No merchandise investment! No advertising risk! Exciting; practical. Copyrighted, notarized proven successful plan 25c. Satisfaction guaranteed! Treasury, 149 Storer, New Rochelle 2-P, New York.

PRINT Without A Printing Press. Big Money! See page 74.

MAKE Money addressing Envelopes at Home! Our information reveals how. Only 30c. Business Bureau, Dept. 45-M, P.O. Box 2224, St. Louis, Mo.

WIN Cash, cars in prize contests! Write for copy filled with current Contests, winning hints and tips. Send only 30c. Wright Contest Digest, Dept. 20-M, P.O. Box 2266, St. Louis 9, Mo.

\$100-\$200 WEEKLY. No selling or manufacturing. Part or full-time. Mahaffey, 3032-A Weldon, Los Angeles 65.

WIN contest money. General Contest Bulletin gives hundreds of tips. List current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

FREE literature describing many money making plans. Doty, 828 East 9th South, Salt Lake City, Utah.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle 2, Wisconsin.

MANUFACTURE Rhinestone and Pearl Jewelry at home. Latest creations, tremendous profits, no skill needed. Postcard brings illustrated catalog of settings, stones, etc. A. V. Cutt Co. Inc., 210-H Fifth Ave., New York 10, New York.

MAKE money with frogs. Particulars free! Specialties House, Whiting 13, Ind.

ADJUSTERS Needed Now! Excellent high pay positions open with airlines, insurance companies and government departments. Send for Free book. Write Today, Universal Schools, P-121, Box 8202, Dallas 5, Texas.

WHAT you sell is free. Only cost, advertising. Plan \$1.00. Melzell, Box 261, Boothwyn, Penna.

MAKE and sell an inexpensive, proven item welcomed by smokers without machinery as I do. Details 25c. Thomas Sales, Box 301-PS, Camden 1, N. J.

MAILORDER selling pays off—when You know How! Free Moneymaking Opportunities publication. Stamp appreciated. Variety, 57-S Circuit Avenue, Newton Highlands 61, Mass.

FREE Book "505 Odd, Successful Businesses" Work Home! Expect something Odd! Pacific-63B, Oceanside, Calif.

YOU for President of your own Credit-Collection Business. Many who answered our ads now have their names on office doors. Franklin Credit, Franklin Building, Roanoke 7, Va.

WE pay you highest rates for hand-decorating greeting cards. Work home. Experience unnecessary. No selling required. Greetings, 100 Madison, Detroit 26.

500 MARKETS for photos. Guaranteed Buyers, list \$1.00. Jones, P. O. Box 159, Rumford, Maine.

MAKE money reupholstering your car, others. Manual tells, shows all, \$2.00, money order, check. C.O.D. Satisfaction guaranteed. Purifoy Upholstery Service, 602 South State St., Box 3042, Jackson, Miss.

39 FORMULAS, PLANS, ETC.

FORMULAS, trade secrets, for nearly everything. Catalog free. Creative Publishers, Winnetka 7, Illinois.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Ill.

FORMULAS for big-profit, fast-selling products. Free literature. Majestic, 530 1/2 S. Main, Elkhart, Indiana.

LABORATORY tested formulas. Lists free. Pont, Box 635-PS, Terre Haute, Ind.

BOOK, 10,000 Formulas, Trade Secrets. Free literature. Ken Paulin, Loudonville, Ohio.

MILLER'S modern manufacturing formulas make products that get the business and pay. Fifty years supplying the best. Literature free! Miller Chemical Company, Tampa, Florida.

SAVE Money! Supplies catalog 15c. refundable. Laboratory Sales, Box 161, Brighton, Mass.

40 PLASTICS

LUCITE, Plexiglas. Any size sheets masked Square foot (12 x 12) cost 1/16" \$1.20; 1/8" \$1.40; 3/16" \$1.75; 1/4" \$2.08. Include 10% postage. Almac Plastics, 230 Fifth Avenue, New York 1, New York.

HI-Profits—Gifts—Jewelry—Free catalogue, details. Pilot Plastics, 67-B Fulton St., New York City 38.

NEW "Trace & Carve" instruction book with material, tool catalog, 50c postpaid. Plexiglas sheets for less. 1/8" 12x12" \$1.30—3/16" \$1.65—1/4" \$1.95, clear-colored, Plastic's, Box 1812, Salt Lake City 10, Utah.

PLASTICRAFTERS supplies wholesale. Literature 20c. Cosmopolitan, Box 176-PS, New York 8, N. Y.

PLASTIC Sheets, Rods, Tubes, etc. Free List, Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

LUCITE, Plexiglas, acetate; casting, molding plastics, findings. Dye manufacturer. Quantity prices. Special bargain lots. Immediate shipment. Complete catalog 10c, 25c airmailed. Gem-O-Lite, Box 6864, North Hollywood, Calif.

LEARN plastics at home. Small cost—spare time. Dime brings sample plastic, three experiments, full details. Plastic Projects, Box 5151, Detroit 35, Mich.

NEW liquid plastic. Clear, colors. Cast without heat. Embed flowers, insects, coins. Saw, drill, carve. Send 25c for Wholesale Catalog and New Sales Manual showing how to make money at home. Castolite, Dept. M-102, Woodstock, Illinois.

41 CHEMICALS & APPARATUS

NEW Idea Chemical and Apparatus Outfits for Home Experimenting. Photo-Scales, Microscopes, Chemicals, Biological and Laboratory Supplies in Small Quantities. Catalog 25c. Established 1931. John H. Winn, 124-B West 23rd Street, New York 11, N. Y.

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

LABORATORY Apparatus, Chemicals, Microscopes. Complete Chemistry Sets, Minerals, Uranium Ore, 10c brings catalog. Porter Chemical Company, Hagerstown 2, Maryland.

SPECTROSCOPE for quick chemical analysis \$3.00. Cutting Sons, Los Altos, Cal.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology, 10c. Tracey Laboratories, Evanston, Illinois.

LEARN Chemical Analysis—Catalog 15c Refundable, first order. Amateur Chemist Supply, 191-49—115 Avenue, St. Albans 12, New York.

CATALOG of chemicals, apparatus, kits, minerals, Uranium ore, 10c. Rex Laboratories, 2849-B Birchwood, Chicago 45, Ill.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Catalog 15c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N. Y.

42 HELP WANTED

FOREIGN & Latin American Employment, 1951 "Foreign Service Directory" gives Up-To-Minute Facts on Military & Civilian Construction, Government Jobs, Major Oil Listings, Aviation, Transportation, Steamship Lines, Mining, Importers, Exporters. How-When-Where to apply, application forms. Hot List Firms Hiring, \$1.00 post-paid. Global Reports, P.O. Box 883-S, Hollywood 28, Calif.

FOREIGN Employment Construction men, building trades, helpers, office men, others, interested in Foreign Projects. High wages, quarters, trans. Listings of firms actively working on U. S., Foreign, Intercontinental Projects. Send \$1 for Foreign Construction Compendium and Application Forms. Foreign Service Bureau, Dept. PS-11, Box 295, Metuchen, New Jersey. (Not an employment agency—no fees.)

\$1,000,000 CONSTRUCTION Projects. "World Wide" printed Monthly Foreign & Domestic employment. Free application blanks tells How-When-Where to apply. \$1.00 complete. Global Reports, P.O. Box 883-PX, Hollywood 28, California.

NYLONS at Wholesale Prices. Fields Hosiery, 99-H Chauncy, Boston, Mass.

43 AGENTS WANTED

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 28 E. Jackson, Dept. 18, Chicago 4, Illinois.

DRESSES 18c; Coats \$2.00; Blouses 35c; Free Catalogue; Crown, 164-PB, Monroe Street, New York 2.

MAKE Wedding Profits. Sell invitations, napkins, matches. Samples free. Dunbar's, Middlebush 5, N. J.

AGENTS—300% profit selling genuine gold window letters: stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

COMMERCIAL Deep Frying Course. Mock Chicken Legs, Potatoes. New and proven methods. Learn about this money-making field, \$2.50. PP, Concession, Toledo 13, Ohio.

MAKE money selling ties. Free catalog. Write to Philip's Neckwear, Dept. 837, 20 West 22 St., New York.

PHOTO-Salesmen-Agents. Sell beautiful hand colored plastic enlargements and sensational new photo compacts, rings, bracelets, lockets, etc. Collect deposit, we deliver. Profitable sideline. Send card, for Free sample kit, Novel Portrait Co., 3343-A North Ave., Chicago, Ill.

NEED Extra Cash? Take orders for personal initialed belts and buckles, cap badges, tie holders, etc. Choice of 3000 emblems. Free sales kit, Hook-Fast, Dept. 1425PS, Providence, R. I.

START Your Own Business on credit. Always your own boss. 1,437 Dealers sold \$5,000 to \$28,500 in 1950; their average \$6,704. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. K-U-PSC, Freeport, Ill.

IS \$210, a week worth a penny postcard to you? Then rush card with name and address for special Free Trial Plan that sells amazing new Automatic Refrigerator Defroster "like hot cakes!" Write to Mr. Lewis, D-Frost-O-Matic Corp., Dept. B-103, 6 N. Michigan, Chicago 2, Ill.

CHRISTMAS Cards At Jobbers Prices! Large selection dollar assortments 35c each in hundred lots. Imprint Cards, Money Folders, Gift Cards, Pictures, etc. Make more profits selling our line! Catalog free! Three sample boxes \$1.00. Elfco, 438 North Wells, Chicago 10.

300% PROFIT—Postage stamp photos from negatives or prints, perforated sheet form, gummed backs. Free details, samples. National Photostamp Co., 1418-G Third Ave., New York 28.

BE A Money Maker . . . Represent magazines year around. Wonderful home work. Big Christmas profits now. Liberal commissions. Everything furnished. Write for Free catalog. McGregor Magazine Agency, Dept. 510A, Mount Morris, Ill.

GOLD Lacquered and Silver Sign Letters. Windows, Doors, Trucks, Standard sizes. Penny each. Free samples. Atlas-G, 544 West 79th, Chicago 20.

SCHOOL Seniors! A postal will bring you our wonder, Kwick-Sell Cardalog of popular Graduation Name Cards. Biggest profits! Only firm giving free Golden Memory Book and Souvenir Chest. Don't miss out. Hurry that postal! Craftcards, Box 235 (m), Pittsburgh 30, Pa.

OWN A Big Moneymaking New and Used Clothing Business. Men's used suits \$2.00, pants 35c, topcoats \$1.25, Jackets 60c, shoes 20c. No experience necessary. Free wholesale catalog. Superior, 1250-B Jefferson, Chicago 7.

NEW Plastic Mending Tape. Just press on! Repairs clothing instantly. Lightning seller. Samples sent on trial. Kristee, 136, Akron, Ohio.

HI-Profits—Gifts—Jewelry—Free catalog. details. Pilot Plastics, 67-B2 Fulton St., New York City 38.

WHERE to Buy 800,000 articles direct from Manufacturers. Save by buying direct. Sent Free. "Your Profits Under The Spotlight." Glass Pub. Co., Ellwood City 4, Pennsylvania.

I'LL Put A "Shoe Store Business" In Your Pocket! Nation's Leader trains you to make Big Money! Fit men, women. Free Sample Outfit—Write Today! Consolidated Shoe System, Dept. 335-F21, Chipewawa Falls, Wisconsin.

PRINTING — Salesbooks — Envelopes — tags. Free illustrated catalog. Ersco, 1937 Patterson Ave., Bronx 72, New York.

SELL new clothing. Lowest Prices. Operate from home, auto, store. Enormous Profits. Big Catalog Free. S&N, 605-D 12th Place, Chicago 7.

ADDRESS Envelopes! Advance Commissions! Homework! Instructions. 25c! Hirsch, Spring Valley 3, New York.

GET into Toys! Big Money. Show free toy-gift line, full or spare time, take orders, pocket juicy profits. Styleco, Dept. 220, Cincinnati 10, Ohio.

GREETING Card Bargains. Personalized napkins, book matches, playing cards. Raum, 4154-B Fifth Street, Philadelphia 40.

"FOG-Stop" Windshield Cloth. Instantly removes blurry Mist, Frost, Sleet, Snow. Stops windshield fogging. Samples sent on trial. Kristee 137, Akron, Ohio.

BUY wholesale 25,000 items. catalogue 25c. Matthews, 1472-A4, Broadway, N.Y.C.

WANT Xmas Money? Perfume Beads sell on sight. Particulars free. Mission, 2328-P West Pico, Los Angeles 6, Calif.

HOW would you like to get paid for "giving away" first quality nylon stockings at 49c? That's all they cost if they run within guarantee period to three months! Advance cash—big bonus. No experience needed. Just write orders. We deliver—collect. Postcard brings you free sample stocking and sales outfit prepaid. Kendex Corp., Babylon 24, New York.

SELL Big Money-Maker to Men and Women. Easy handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Mass.

ANYONE can sell Hoover DuPont Nylon Uniforms for beauty shops, waitresses, doctors, nurses, others. In white and colors. Exclusive styles. Top quality. Low priced. Exceptional income. Real future. Equipment free. Write fully. Hoover, Dept. T-101, New York 11, N. Y.

MEXICAN feather pictures. Sell on sight; 200% profit! Free details; sample 10c stamps. Sylvia-SR, Apartado 9036, Mexico City.

BUY Wholesale thousands nationally advertised products at big discount. Sent free "The Wholesale Plan." American Buyers' Service, 629-T Linden, Buffalo, N. Y.

RAT-Deth Franchise (home-office). Sales-service bulletin—Free. Farm Products, PC-51, Excelsior Springs, Mo.

COUNTY Agents. Gas-electric mowers. Wood saw. Sickle bar. Sell dealers. Farm Products-FR, Excelsior Springs, Mo.

SALESMEN, Distributors, fast selling costume jewelry direct from factory. Big picture catalog free. Plekcraft, C-19 Bank, Attleboro, Massachusetts.

FAST sellers. Big demand. Catalog. Parker Drug Co., Hoboken 6, New Jersey.

MEN And Women. Earn extra money—part time. Every store a prospect. Unusual, exclusive Christmas item. High value, low cost, 100% profit. Harvey W. Durocher, 1408 Drexel, Detroit 15, Mich.

BARGAINS!! Save up to 50%. Balloons, combs, novelties, notions. Carleton House, (PSM), Texas City, Texas.

FREE book "505 Odd, Successful Businesses." Work Home! Expect something Odd! Pacific-62B, Oceanside, Calif.

BARGAINS—Terrific Savings—Job Lots—Close-outs! Also save up to 50% on complete lines of Drygoods, Clothing, Hosiery, Notions, Drug Sundries, Toiletries, Novelties, Gifts, Jewelry, Television, etc. 2000 items. Send 25c for Illustrated Wholesale Bargain Catalog, Close-out Flyers, and Special "Get Acquainted" offer. Valuable merchandise certificate (worth many times 25c) included Free. Reliable Jobbers, 311-J North Desplaines, Chicago 6.

RED Glow warning signals for Motorists. Police, Air Raid wardens. Sample 25c. Red Glow, New London, Conn.

TALKING Christmas & Birthday Cards. Pull tape and card clearly says "Merry Christmas". Retail 25c. Sample 25c, five for \$1.00 with wholesale prices. Minas, Box 18214-R, Los Angeles 33, Calif.

44 HIGH-GRADE SALESMEN

EARN Big Money Fast! Sell finest-quality advertising work uniforms to garages, factories, filling stations, etc. Free selling kit. Topps, Dept. 5411, Rochester, Indiana.

MAKE money showing neighbors how to beautify yards with glorious flowering shrubs and trees. Quick-bearing Dwarf fruit trees; World-Famous Stark Patented Varieties produce abundant harvests champion-quality apples, pears, peaches, other fruits. Even small plots produce fruit for family-use and to sell. Beautiful Sales Kit Free. Stark Bro's., Dept 30152, Louisiana, Missouri.

ESSENTIALUBE—The scientific modern motor lubricant—that lubricates as it cleans—as it powerizes, needs mechanically inclined men above thirty to tell it's astounding story to farmers and machine owners from coast-to-coast. Must have car and ambition. Full field training by Division Manager. Liberal drawing account, quarterly and yearly bonuses, high commissions. Rapid advancement for good men. Write at once, giving full qualifications to Petroleum Division, Box 1341, Dallas, Tex.

UP to \$50.00 in a week spare time and tailored suit for yourself without paying one cent. Write for plan and Free Sample Case. W.Z. Gibson, 500 S. Throop, Dept. Z-527, Chicago 7, Ill.

ENJOY Tremendous Profits selling Christmas Displays. Annual cleanup for hustlers. Literature Free. AdPro, Box 592-PS, Springfield, Ill.

WRITE 3 Words—Collect \$7.65 on 10-second Demonstration to merchants—write on glass with Amazing Magic Crayon—Presto!—5-color advertising message takes fire—glows like brilliant Neon. Three sales daily bring \$22.95 profit. Rush postcard for details.—Complete Sales Kit, Free! Maxilume Co., 125 W. Hubbard, Dept. CL-911, Chicago 10, Illinois.

AD Matches! Sell Amazing Designs—20, 30, 40 and 240-light book matches. Biggest spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy Nothing! Sales kit furnished. Match Corp., Dept. PS-23, Chicago 32, Illinois.

WANT to make real money? You can positively make \$50.00 a day and up selling a brand new item going to every type of food and beverage store, factories, Laboratories, Hospitals, etc. First time advertised. Write for Free Details today. Johnson-Hartman, 53 West Jackson Blvd., Dept. PS-11, Chicago 4, Illinois.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-1151, 7530 Greenwood, Chicago.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought). Lee Mountain, Pisgah, Alabama.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203-M, Cedar Grove, N.C.

START a Collection Agency business. Very profitable. Quickly learned. Write Cole & Associates, Syracuse 2, N. Y.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-B, Austin, Texas.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of PsD, or MsD. Solve mental worries. Free book. College of Universal Truth, 5153-K N. Clark, Chicago.

LEARN Piano Tuning. Repairing—at home in 30 days. Unlimited income. Phonograph recordings, tools and instructions furnished. Write Capitol City Tuning School, Department C-1133, 129 East Michigan, Lansing 16, Michigan.

USED Correspondence Courses, Bought, Sold, Rented. Free list. Home-Study, 408 North High, Salem, Indiana.

"DYNAMIC Mind-Power" Directs your Powerful Sub-Conscious Mind to bring you Positive Personal-Success! \$1.00 Psychology Publishing Co., 673 S. Coronado St., Los Angeles 5, Calif. Dept. P.

BECOME An Accountant. No previous bookkeeping experience required. We train you at home spare time, low cost. Ask for free booklet, "Accounting, the Profession that Pays." LaSalle Extension University, a correspondence institution, 417 South Dearborn Street, Dept. H786, Chicago 5, Ill.

U. S. Gov't Jobs! Men—Women. 50,000 jobs open now! Start high as \$66.34 week. Experience usually unnecessary. Can you qualify? Get Free 32-page book—showing jobs, salaries, requirements, sample tests. Write: Franklin Institute, Dept. C-22, Rochester, New York.

USED Correspondence Courses and Educational Books Bought, Sold, Rented. Catalog Free. Educational Exchange, Summerville, Georgia.

COCKTAIL Lounge Bartending and Management. Home study c./ School Training. American Bartending School, P-334 S. Wabash Avenue, Chicago 4, Illinois.

LEARN Tailoring in one of America's finest tailoring schools. Write book 10. Empire Institute of Tailoring, 423 East 5th, Hazleton, Pa.

PRACTICAL Nursing—Learn Easily at Home. Spare Time. Big demand. good earnings. High School not necessary. Write for free facts. Wayne School. Dept. FH-4. 2525 Sheffield. Chicago 14, Ill.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—51st year. G. I. Approved. Write for booklet. Niles Bryant School. 77 Bryant Bldg., Washington 16, D. C.

STUDY for game warden. park, forestry, and patrol service. Write Delmar Institute. D16, Whittier, Calif.

TIRED Of No Money. second rate jobs? Like to start a real career with a lifetime of high salaries? Write me about two growing fields that really need men. Ed. Howes, Chief, National Schools. 4000 S. Figueroa Street, Los Angeles 37.

HIGH School—No Classes. Study at home. Spare time. Diploma awarded. Write for Free catalog. HBA-7, Wayne School, 2527 N. Sheffield. Chicago 14, Ill.

BOOKKEEPERS! "What You Should Know About a Bookkeeping Service." 25c. James, Box 1281. Lubbock, Texas.

HERE is a winning "must" if you want to cash in on your undiscovered success ability. This fascinating new method of Thought and Behavior Control is advancing others. Why not you? Rush your request today for amazing free booklet and exciting home-study details. President Ballard, Washington Bldg., Louisville 2, Kentucky.

WELDING training pays at Hobart Welding School. Box P-1112 Troy, Ohio. VA Contract. Best equipment. Catalog Free.

\$200 WEEKLY Reported! No selling. Free booklet. T. J. Surface. Roanoke 4, Va.

INCREDIBLE! Unprecedented! Look under "Personal!" B1jou. Box 1727-VH, Hollywood 28, Calif.

ALGEBRA. Trigonometry. Calculus. Individualized instruction. Free details. New Correspondence School. Box 27, St. Johns. Brooklyn 13, New York.

SCIENCE of memory amazingly simplified. New book. Information free. Memory Studio. 2016-S Sunnyside. Chicago 25, Illinois.

DO you want Big Money? Men-Women adjusters needed by airlines, steamship lines, insurance companies. Qualify now. Many earning up to \$125 week. Free book. Write today. Universal Schools, P-141, Box 8202, Dallas 5, Texas.

BANISH Stammering. \$1.00. J. Allen, Box 114, Saskatoon, Sask., Canada.

EARN \$50.00 daily, home or office. Rush season coming. Details Free. Universal, Box 664-P, Springfield, Missouri.

STOP Forgetting! Good memory pays. Newly discovered method brings amazing results. Memory Institute, Box 261-S, Staten Island 1, N. Y.

46 CONTESTS

TIE-Breaker picture puzzles exposed. \$1.00. Winograd, Box 1495, Philadelphia 5, Penna.

47 DETECTIVES

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write. Wagoner, P-125 West 86th, New York 24.

DETECTIVE Training. Phillips Secret Service System. 1917-C North Kenneth, Chicago 39, Ill.

48 LANGUAGE OUTFITS

LISTEN and Learn A Language by Linguaphone. At home, quickly, easily, correctly master Spanish, French, German, Russian, Asiatic—any of 29 languages through Linguaphone Conversational Method. Add to service, job, travel opportunities. Send for Free book. Approved for Veterans' Training. Linguaphone Institute, 5411 Rockefeller Plaza, N.Y.C.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

MAILING Lists. All kinds 1000 \$5.00. Dixie Service, King, N. Carolina.

300 SWAPPERS who swap anything \$1.00. Toole, Bernardin Apts., Evansville, Indiana.

51 SPECIAL SERVICES

VACATIONLAND Postmark—letters re-mailed 25c coin. 5—\$1.00. Information—Contacts. Box 305 (Riv. Sta.), Miami, Fla.

PUERTO Rico Remail 30c. A. Soto, Box 54, Bayamon, Puerto Rico.

52 AUTHORS SERVICE

"TEN Steps To Writing Success" reveals How you can write stories, poems, articles for publication. Details Free. Will Herwell, 7016 Euclid, Cleveland 3, Ohio.

I Want New Writers. Experience unnecessary. Earn at home, spare time. Details Free. Saunders M. Cummings, 468-15 Independence Bldg., Colorado Springs, Colo.

53 ADVERTISING

ADVERTISE: 24 words. 40 Newspapers. \$3.50. Lists Free. Advertising Bureau, 10811-P Springfield, Chicago 43.

ADS—Direct Mail—Small accounts invited—Art—Copy—Publication placement—Printing—Low Rates—Established 1931. Advisors Inc., Plymouth, Michigan.

24 WORDS in 50 Weeklies. \$4.96. H. J. Darnell, 730 Hays, Jackson, Tennessee.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 1911-C, Pleasant Hill, Ohio.

SIGNS—Made to order. Signpost, 200 Mardick Rd., Richmond 24, Virginia.

ARTISTIC back dated Art Magazines, eight \$1.00 postpaid. Wonderful courses, drawing, painting, cartooning. Free catalog. Art Book Shop, Arnold 5, Missouri.

BARGAINS on Famous Art Courses. Moneymakers for Amateurs, etc. Literature free. National Artists, Dept. C, 801 North Marsalis, Dallas 8, Texas.

CHALK Talks. Laugh Producing Program. \$1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

YOU too can be a chalk talk artist. Make money—have fun. New book tells how, step by step. Send \$1.00 to Wilton Publishing Co., Wilton, Maine.

55 TYPEWRITERS & OFFICE MACHINES

PRINTOMATIC selffeeding Post Card printing Duplicator \$15.75. Envelope Addressing Machines \$24.50. Pittsburgh Typewriter Company, 336-G Fourth Avenue, Pittsburgh 22, Pa.

TYPEWRITERS. Printing Devices. Office Machines supplies appliances. Dixie Graph, King, N. Carolina.

NEW! Terrific! Typewriter Ribbon. Erases like magic. Durable, long service. Real time saver. Makes typing a pleasure. Mail \$1.50, week's trial. Refundable. Amity Co., New Canaan 1, Conn.

TYPEWRITERS \$22.50. Duplicators \$13.25. Typewriters, 118 North Spruce, Wichita 7, Kansas.

56 RUBBER STAMPS & OFFICE SUPPLIES

PICTORIAL rubber stamps (sample, 1" star, 50c). Stampico, 8833 Quincy, Detroit 4, Mich.

LINE 20c; 2-45c; 3-65c. Stamp Shop, Auburn, Nebraska.

3 LINES 50c; Pads 35c; Signatures \$2.00. Printright, Wauwatosa, Wisconsin.

SUPERIOR Rubber Stamp, three lines. \$1.00; one, 40c. Pad, 40c; dater, 75c. 50-50 imprinted stationery. \$1.00. Catalogue. Prompt service! Johnson Press, Box 6-B, New York City 26.

57 PRINTING, MULTIGRAPHING, ETC.

BUSINESS Printing. Samples, prices free. Howprint, 723-S Eunice, Webster Groves 19, Missouri.

1000 BUSINESS Cards \$2.50 Prepaid samples Free. Reliable Print Shop, 905 East Jefferson, Louisville 6, Ky.

QUALITY Printing. Booklets, publications, circulars, stationery. Free price list. Adams, 30 West Washington, Chicago 2, Ill.

PRINT Without A Printing Press. Big Money! See page 74.

QUALITY Printing. Low prices. Samples. Val-U Press, 241 Flat Shoals, Atlanta, Ga.

LETTERPRESS and Offset Printing. Submit samples or specifications for estimate. Raum, 4154 Fifth Street, Philadelphia 40.

FREE samples, prices. Quality work, postpaid. Fast service. Sutton Printing, 341 State, Waycross, Georgia.

INEXPENSIVE offset printing eliminates cuts. Folder 3c. Pengad, Bayonne 5, New Jersey.

ENVELOPES, letterheads, statements, etc. Samples, prices. Mercury Press, Box 695, Marengo, Iowa.

BUSINESS Cards with glamour. Samples, prices free. Heavener's, Colmar 1, Pa.

100 8 1/2 x 11 LETTERHEADS \$1.00 Postpaid. Envelopes same. Race Printing, Hudson, New York.

58 PRINTING OUTFITS, SUPPLIES

PRINT your own cards, stationery, circulars, advertising. Save money. Simple rules. Print for others, nice profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, L-8, Meriden, Connecticut.

PRINTING Presses. Type Supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

PRESSES. Supplies. Paper, catalog 10c. Custom, Box 211-S, Springfield, Missouri.

MAKE your Own, self-molding, rubber printing cuts. Flexirubber, Argyle 2, Wisc.

59 PATENT ATTORNEYS

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

"INVENTOR'S Guide" free. Frank B. Ledermann, Registered Patent Attorney, 154 Nassau Street, New York.

INVENTORS. For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

PATENT Protection—This well-known organization will send you promptly upon request and without obligation, a booklet containing detailed information concerning steps to take to protect your invention by a United States Patent. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 641-M Merlin Building, Washington 6, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 12B-K District National Building, Washington, D. C.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

PATENTS—Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorow, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 1435 Victor Building, Washington 1, D. C.

60 FOR INVENTORS

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent, as he qualifies to give a worthwhile patentability report. Record of Invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 939 Columbian Bldg., Washington 1, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

CASH For your idea, 280 manufacturers need inventions, patented or unpatented. List free, Invention Bureau, 208-S Clinton, Oak Park, Illinois.

INVENTORS, For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 631-E St., N.W., Washington 6, D. C.

INVENTIONS Promoted, Patented or Unpatented, Established 1911. Write Adam Fisher Company, 183 Enright, St. Louis, Missouri.

INVENTORS—If you consider your invention to be something of importance, take steps to protect it with a United States Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" outlines steps to take to secure patent protection. Mailed promptly without obligation. Victor J. Evans & Co., Merlín M. Evans, Registered Patent Attorney, 642-M Merlín Building, Washington 6, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 12A-K District National Building, Washington, D. C.

PATENT Searches, \$5.00, including patent copies. Same reliable search as conducted for patent attorneys. Free protection forms, 48 hour service. Patent Service Institute, 945-B Pennsylvania Avenue, Washington 4, D. C.

PUBLICIZE your inventions! 78 National Magazines—51 Million Circulation! Details, 25c. "78-B Simon", 59 Park Avenue, New York City 16.

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorow, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorow, Berman & Davidson, Registered Patent Attorneys, 1434 Victor Building, Washington 1, D. C.

INVENTORS! Have you good patentable ideas? Write Patent Agent Metzler, 11 West 42nd, New York.

INVENTIONS promoted patented, unpatented. Complete services. M. Joyce Humphries, 1425 Landtitle, Philadelphia 10.

IF you have a new idea, development or invention get an expert appraisal and opinion before you spend hundreds of dollars. Over 25,000 inventions screened and reviewed. Also sales and distribution advice. Free details or send \$3.50 for each specific problem. Marketing Bureau, Gables Building, Evanston 2, Illinois.

PATENT Searches \$5.00, 48-hour service. Patent Applications and Drawings prepared. Protection forms free. Write Miss Ann Hastings, Patent Searcher, P.O. Box 176, Washington 4, D. C.

INVENTORS: Obtain patents without assistance. Save time and money. Eliminate unofficial disclosures. Make your own patent searches at home. Complete handbook, \$3.50. International Patent Library, Post Office Box 7412, Washington 5, D. C.

PATENT Searches \$5.00, including copies of closest patents. Same reliable searches we conduct for Patent Attorneys. 48 hour Airmail Service. "Record of Invention" free. Capitol Patent Service, Box 664-S, Washington 4, D. C.

61 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 631—E Street, N.W., Washington 4, D. C.

INVENTORS—What have you, patented, patent pending available for manufacturers? Booklet mailed free. Address: Market Contacting & Date Service, 11106-B2 Longwood, Chicago 43.

INVENTIONS Promoted, Patented or Unpatented, Established 1911. Write Adam Fisher Company, 183 Enright, St. Louis, Missouri.

CASH or royalty for your invention. We provide this opportunity. Free details. Inventors Patent Exchange, Inc., Dept. D, Hartford 1, Conn.

CAPITAL, Manufacturing, Sales Facilities Available, G & M Company, Traffic Station, Box G, Minneapolis 3, Minnesota.

INVENTIONS Wanted, Patented or Unpatented, 20 years experience Promoting Inventions, National Service Bureau, 3132 Meramec, St. Louis 18, Missouri.

63 MANUFACTURING

ANYTHING made of sheet metal, odd fittings, funnels, gear guards, etc. Henry Stein, Grape Street, Pittsburgh 10.

64 MODELS, MODEL SUPPLIES

SHIP and Yacht model fittings: blueprints. Send 25c for illustrated catalog No. 26—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah, Royal Oak, Mich.

SHIP Models—most complete line in New England Kits, parts, plans, books, tools, Engines, motors. New illustrated catalog, 25c. James Bliss & Co., Inc., 220 State St., Boston, Mass.

BUILD Historic ship models, complete kits, 50c to \$9. Catalog 15c. Ideal Models, 21 West 18th, New York 11, N. Y.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

FAMOUS Catalogs, Ships (120 pg. Historic Models, hundreds fittings) 50c. Worlds Electric Trains & Accessories 50c. H. O. Scale Trains (ready Dec.) 50c. Old time vehicles 15c. Hobby books 10c. Collectors soldiers 25c. Polks Hobbies, 314S 5th Ave., New York City 1, N. Y.

HOME Models and Doll Houses are fun to build—profitable to sell. Design your own or use our suggestions. It's easy, economical and time-saving with our accurately-scaled plywood panels of brick, siding, shingles and plastic doors, windows, etc. Send 10c for samples and booklet, "How You Can Build Model Homes." Architectural Model Materials, Inc., Dept. S-111, 4208 Armitage Ave., Chicago 39, Ill.

MODEL locomotives smoke longer, better, liquid Loco Smoke, 2 oz. 69c. CCC Products, 8023 5th Avenue, Brooklyn 9, N. Y.

LIONEL; American Flyer; Illustrated catalog free. Ben's PS Department, 134 North Dearborn, Chicago 2.

SENSATIONAL Offer! American Flyer 501T Atlantic Freights complete—smoke, "choo-choo", track, transformer—guaranteed one year. Regular \$23.95—Only \$19.95. 5108W Sante Fe Diesel Passenger Regular \$69.50—Only \$57.95. Send check or money order. Northern Hardware Company Broad and Rockland Streets, Philadelphia 41, Penna. C.O.D.'s accepted! For complete train catalog and sensational price list send 10c. Over 1,000 sets in stock!

BRASS Gears and model supplies for the inventor. Send 10c for catalog. Pierce Model Works, Tinley Park, Ill.

STEAM engines, boilers, castings, Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

FOR Sale—Small Toy Motors. We have approximately 4,000 motors which will sell at a special close-out price of \$1.00 each—cash in advance or C.O.D.—no returns. Small permanent magnet type D.C. motor—will operate on 1 to 4 flashlight cells obtaining speeds as high as 12,000 RPM. Precision 5 pole armature on brass insert bearings—can be used to operate toy autos, locomotives, boats, remote structures, switches, etc. Gold Cup Model Boats, Inc., 1407 Washington Blvd., Detroit 26, Mich.

BUILD, Fly three "Quicky" 18" scale models for only \$2.00. Glue 15c extra. Airplane Catalog 3c. Cleveland Model, 4507TC202 Lorain, Cleveland 2, Ohio.

65 HOME CRAFTSMAN

LEATHER, tools, lacing, supplies. Free Catalog. National Handicraft, 199 William St., New York 7.

TURN your spare time into cash. Make quick-selling, highly profitable lamps—every home a prospect. No experience or special tools required. New 1951 56-page illustrated catalog shows shades, shade frames, figurines and bases, oil lamp converters, boring compounds, and dozens of similar items. Also all kinds of sockets, cords, pipes, harps, finials, bases, and hundreds of other parts—everything you need. Special 8-page section shows 6 beautiful lamps in kit form ready to assemble. You buy wholesale, sell at retail—make big profits. Hundreds doing it. You can, too. Send 25c today for catalog and wholesale price list. Refundable first order. Gearon Co., Dept. 500-A11, 27 S. Desplaines, Chicago 6, Illinois.

OUR biggest Leather and Craft Catalog yet! 1000's of items. Send 25c (refunded with 1st order). Russo Handicraft Supplies, Dept. O-10, 245 S. Spring, Los Angeles, California.

MAKE leather belts, billfolds, purses. Big catalog and genuine steerhide keyholder, 10c. Tandy Leather, Box 397D, Tulsa, Okla.

MAKE, Sell, Artificial Flowers, Cor-sages, Chenille Dolls, Jewelry, Starting kits, Woodfibre, Leaves, Shellcraft, Rhinestones, Sequins, Findings, Wholesale Profitcraft Catalog, 10c. Cleveland Models, 4507TC114 Lorain, Cleveland 2 Ohio.

FREE book "Practical Painting, Wood Finishing" shows how to get professional results. Furniture finishing, workshop projects, home decorating. Complete Modern brush and spray methods. Tricks you've never seen. It's Free! Write Home Craftsman, 115-F Worth St., New York 13.

PROFESSIONAL type furniture finishing and refinishing supplies. Beautiful new, complete, illustrated catalog and complete simplified instruction manual 25c. Colorall, Dept. S, 515 Cedar Lane, Teaneck, N. J.

SOMETHING new. Log cabin Bank. Easy to make. Nice Christmas presents for kids or grown ups. Send \$1.00 for sample. Robert Butler, 208 Troy St., Dayton 4, O.

KNOCKDOWN Cedar Chest, Lumber and Veneers, Free Price List, Giles Co., Brownsboro, Alabama.

89 FULL size Jig Saw patterns of beautiful shelves, ornaments, toys, novelties. Plus "How, Where to Sell." Only \$1.00. Mastercraft 114S, 7041 Olcott, Chicago 31, Illinois.

LEATHERCRAFT. Everything needed by beginners, advanced hobbyists and professional leatherworkers. Largest stock of supplies in U. S. Moderate-priced tooling leathers, top quality calfskins, tools, supplies, kits. Send 10c for Big Catalog, J. C. Larson Co., 820 S. Tripp, Dept. 1376, Chicago 24, Illinois.

LEATHERCRAFT supplies catalog. Pleasure and profit. New style handbag patterns, belts, Leathercraft school G.I. approved, 25c for catalog (Refund 1st order). Dept. PS, Apache Leather Co., 2804 E. Washington St., Phoenix, Arizona.

5" LAMBS wool polishing bonnets, 3 for \$1.00. Kovler, Clementon, New Jersey.

LEATHERCRAFTERS—metal ornaments—buckles—pocketbook accessories. Cosmopolitan Metalcrafters. Box 176-B, New York 8.

BANDSAW, Jigsaw owners, let your machine bring extra profits, fun. Free details. Nu-Art. Dept. A. Box 2235, Boston, Mass.

VIOLINMAKERS: Amateurs—Professionals. Fine tone European wood, materials, supplies. Illustrated catalogue 10c refunded. Premier Violin Supplies, 430 S. Broadway, Los Angeles 13, Calif.

90 All new, full size lawn ornament and novelty patterns, up to 20" high. Only \$1.00. Mastercraft 112S, 7041 Olcott, Chicago 31, Illinois.

100 FULL size jig saw patterns up to 20" high, only \$1.00. Pattern Service, Medway 8, Massachusetts.

FREE catalogue 150 woodworking patterns. D. Spears, Bedford Hills, New York.

LEATHERCRAFTERS: Everything for the leather crafter, large illustrated catalogue 10c. Art Leather, 411 Joseph Ave., Rochester 5, New York.

ALABASTER—Homecrafters. Now you can have something new and beautiful that can be worked on the Lathe, or carved with ordinary woodworking chisels. Write for information and price list. Alabaster Sales, 423 S.W. 23rd St., Oklahoma City 9, Oklahoma.

LEATHERCRAFT, Copper tooling, textile painting, many other crafts. Big free catalog shows everything you need. Kit Kraft, 7377 Melrose, Hollywood 46, Calif.

80 FULL sized patterns Lawn Ornaments, Toys, Novelties \$1.00. Modern Woodcraft, Saginaw, Mich.

SQUAREKNOTTERS: Make belts, hand bags, etc. Quality cord samples with catalog free. Special! Beginner's book, catalog and samples 10c. P. C. Herwig Co., Dept. P40, 121 Sands St., Brooklyn 1, N. Y.

ENGINEERS—Draftsmen—Mechanics. New simple planimeter rapidly measures irregular areas. Practical; make it yourself in ten minutes at cost of 30c. Copyrighted illustrated treatise with instructions \$1.00; W. A. Thomas, Consulting Engineer, 2742 Philadelphia Ave., Pittsburgh 16, Penna.

CLEAN your sandpaper with Sand Re-Nu \$2.50 gallon, \$2.40 a gallon in five gallon cans P.O.B. Minneapolis, Massie Manufacturing Co., Box 28, Lake Street Station, Minneapolis 8, Minn.

MANUFACTURE Your own jewelry at home for pleasure and profit. Write for new 1951 Catalog. Great Lakes Plastic Company, 851 Sycamore Street, Buffalo 12, New York, Dept. PS.

LEATHERCRAFT Tools, Leather Embossing Plates, Craft Accessories. Dies. Catalogue 10c. Louis Jones Engineering Company, 1613 Main, Fort Worth, Texas.

CHERRY chests, chairs, tables, stools, wall racks, miniatures. For you to assemble, finish. Catalog, Eby Reproductions Co., 106, Paradise, Penna.

HARDWOOD Plywood. All Species, thicknesses and sizes. Low mail order prices. Send 6c for complete price list. Plywood Sales Co., 1209 West Lake Street, Minneapolis 8, Minnesota.

66 BUILD IT YOURSELF

GRANDFATHER clock building made easy. Shoptested plans Spirit Century narrow waist or stately straight side Spirit America, dollar—both plans dollar fifty. Kuempel Clox, Minneapolis 16.

FOLDING Breakfast Nook—Easy to make, send name and address for specifications and drawings with \$1.00 to Ken-Kraft, 319 E. Jackson Blvd., Elkhart, Indiana, Dept. B.

BUILD Your Own "Tractor". Free information, Eltraco D-5, Camptonville, Calif.

STREAMLINED, Built-in Kitchen cabinets to fit any kitchen. Illustrated manual describes designing and construction. All for \$1.00. Thombert Company, Newton 11, Iowa.

STREAMLINED kitchen construction plans 50c; Playnecabinets, 4617 Johnson, Western Springs, Ill.

MAKE \$300 "Strad" violin! Everything supplied. Fraser, 2025-P Stark, Saginaw, Michigan.

"CONCRETE Block Homes." 32 Page booklet on how to build. \$1.00. Other Home Building booklets, \$1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

FREE Handbook, build sawmills, block machines, freezers, tractors, scooters. 250 shop, farm, home machines. Nichols Co., Dept. C-1200, Purvis, Miss.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

NEW catalog lists over 5,000 styles! Gold plated jewelry supplies, Rhinestones, Pearls, etc. Complete details, only 10c. Barry's 47-12 Branford Place, Newark 2, N. J.

HIGHEST Cash Paid For old, Broken Jewelry, Gold Teeth, Watches, Silverware, Diamonds, Spectacles, Platinum. Free information, Satisfaction Guaranteed, Rose Smelting Company, 29-Y East Madison, Chicago.

ASSEMBLE rhinestone jewelry. Introductory assortment \$1.00—Montague, Box 746, Wilmington, Delaware.

GOLD plated Jewelry Supplies, Rhinestones, Moonstones, Pearls, catalogue 10c. Hobby Shop, 99 Prospect St., Paterson, N. J.

RHINESTONES, jewelry settings, cameos, sequins, beads. Catalog Free. J & M Novelties, Dept. CM-4, Griffith, Ind.

JEWELRY Making Catalog, Milady-Fair Co., 35 Maiden Lane, New York City 38.

68 TOBACCO & PIPES

PIPE tobacco flavors, unique, interesting, information free. Cozza Pharmacist, Pequannock 2, New Jersey.

ROLL 200 pleasingly mild cigarettes for 75c, particulars free. Pete Moberly, Box 841, Owensboro, Kentucky.

69 FOR THE HOME

CESSPOOL trouble? Use Peps-It. Rejuvenates fermentation action, saves pumping costs, deodorizes, reduces masses. Costs only \$2.50. Safe, Sanitary. Free descriptive literature. Chemical Cesspool Cleaning Co., Boston 34, Mass.

WATER Softeners. Buy direct from factory, save money. Write for price list, Shursoft Water Softener Co., 4242 W. Lisbon Ave., Milwaukee 8, Wisc.

70 OF INTEREST TO WOMEN

UNCROWDED Artificial Flower-Jewelry-Doll-Novelty Business. Easy to enter part time, 200% to 500% profit. Quickly sell on sight anywhere. Easy starting kits, supplies, instructions furnished. Wholesale Profitcraft Catalog, Business Plan 10c, Cleveland Models, 4507TC115 Lorain, Cleveland 2, Ohio.

NEED a gift? Literature, Sample free. Box 48, Brooklyn 25, New York.

71 FOR SALE MISCELLANEOUS

DRESSES 18c; Coats \$2.00; Blouses 35c. Free Catalogue, Crown, 164-PS Monroe Street, New York 2.

GERMAN atrocity photos thirty 616 two dollars. Bernard Kobel, Frankfort 6, Indiana.

UNUSUAL gifts, Catalog free, Modern-age Sales, Box 507, Hollywood, Florida.

SAVE Money on Chrome Cabinet Hardware. Write Box 89, Troy, Ohio.

BOXES—mailing, small quantities. Free price list, Altwater's, 7023 103rd St., Jacksonville, Florida.

72 WANTED MISCELLANEOUS

SCRAP Mercury (Quicksilver) Tantalum—Bismuth—Tungsten. Metallurgical Products Co. Established 1909, 35th & Moore Sts., Philadelphia 45, Pa.

SCRAP Platinum—any shape or form. Will pay, at present, \$75.00 per troy oz. (Price subject to market conditions). Metallurgical Products Company, Est. 1909, 35th & Moore Sts., Philadelphia 45, Pa.

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

74 RAZOR BLADES, SHAVERS

XMAS Special, Ball pen 100 double-edge razor blades, guaranteed \$1.00, Payne, 5426 Fifth Ave., Los Angeles 43, Calif.

75 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies, Illustrated List Free. Zeiss, 728 Lesley, Rockford, Illinois.

76 DRAWING, SUPPLIES & EQUIPMENT

DRAFTING and artists' materials catalogue—thousands of items—25c (deductible first \$2 order). Gordon's, 219 Madison, Chicago.

77 TREASURE FINDERS

TREASURE Hunters! New 11-pound featherweight Model 101 locator for gold, silver and minerals. Money-back guarantee best available. Also Geiger Counters for uranium prospectors. Complete information free. The Goldak Company, 1540 W. Glenoaks Blvd., Glendale 1, Calif.

GOLD, Silver, Metal Detectors, Geiger Counters for Uranium, Mineralights. Sensational new fully guaranteed models. None Finer. Information Free. Detectron Co., 5631 Cahuenga Blvd., North Hollywood, California.

SELECTIVE Metal & Mineral Detector. Highly sensitive. Revolutionary new design. Write for literature, Gardiner Electronics Co., Dept. 20, 2018 N. Dayton, Phoenix, Ariz.

TEST for Gold, Silver, Uranium Yourself. Information \$1.00, Lab., Box 232, Cashmere, Washington.

TREASURE—M-Scope Geiger Counters—Mineral Locators. Why buy something inferior when you can buy the best at a lower price? Backed by years of experience. Fully guaranteed by factory. Detects minerals, metals, gold, silver, coins. Payment plan available. Proven superior performance. Free 16 page illustrated booklet. Fisher Research Lab., Inc., Palo Alto, Calif.

78 WATCH REPAIRING

LEARN Watch-Clock Repairing at home. While learning we fix all watches for you. Inquire Modern Technical Supply Co., 55-PS West 42 Street, New York 18, N. Y.

"THE Modern Clock". All about clock repair, 502 pages, 173 illustrations, \$4.95 postpaid, 10-day return privilege. North American Dept. 21L, 2018 North Avenue, Chicago 47, Ill.

WATCHMAKERS' complete informative catalogue 20c deductible. Bengal Company, Culver City, Calif.

WATCHES cleaned \$2.50, confidential trade prices. Simon, Huron Street, Lake Ronkonkoma, New York.

5 **ELGIN**, Waltham, Illinois, Hampden Gents' wristwatches, needing slight repairs, \$18.00. Write for prices, B. Lowe, Holland Bldg., St. Louis 1, Mo.

79 MISCELLANEOUS

CAN You Make \$40.00 A Week, typing at home, in your spare time? Write Hood's, Kannapolis 11, North Carolina. (Enclose stamped, addressed envelope).

DRESSES 18c; Coats \$2.00; Blouses 35c. Free Catalogue, Crown, 164-PC Monroe Street, N. Y. 2.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-B, Austin, Texas.

OUTDOOR Toilets, Cesspools, Septic Tanks cleaned, deodorized with amazing new product. Just mix dry powder with water; pour into toilet. Safe, no poisons. Save digging, pumping costs. Postcard brings free details. Burson Laboratories, Dept. E-53, Chicago 22, Illinois.

AGED Perfume in 1/2 oz. Attractive bottles, @ \$1.00 per bottle. Gardenia, Apple Blossom, Bouquet, Heliotrope, Orchid, Hyacinth, Chypre, Fougere, Flor de Amor, Pine, Eau De Cologne and Heather. H. K. Co., 1027 Dechman, Peoria 4, Ill.

SWISS Musical Church miniature, snow-covered. Plays "Silent Night" when door opens. Builds family tradition, \$7.50 postpaid. Kit form to assemble \$5.95. M. A. Sales, Livermore, Iowa.

PANNING Gold lesson—Catalogue Beginners supplies, Mining Books, Maps, "Where To Go", Free, Old Prospector, Box 729D2, Lodi, Calif.

YOUR Leather Jacket renovated expertly. Free circular, Berlew Mfg. Co., Dept. 7, Freeport, N. Y.

RECEIVE Giant Mails, magazines, catalogs! Three months 25c, year 50c. Waddell's Directory, 341-D East 76th, New York 21.

BIG Mails Three Month, 25c year Name Listed Directory \$1.00. Harvey Teeple, Decatur, Indiana.

MINERAL—Treasure Locators—Geiger Counters, Superior performance, lowest prices. Payment plan available. Free literature. Fisher Research Lab., Inc., Palo Alto, California.

SOURCES of Supply, 50c each, Kelly, 9544-A Whitcomb, Detroit 27, Michigan.

SEEK Gold, Uranium, Buried Treasure. Latest low cost super-sensitive equipment. Free literature. Glen Scientific, Box 151-D, Glen Ellyn, Illinois.

RECEIVE mails, magazines, samples. Your name in numerous mailing lists 20c. Warren Greenwood, 273 Broadway, New York 7.

BUY Direct wholesale 750,000 articles. Directory 25c (refundable), Publishers, Box 1302-A11, Detroit 31.

50 ASSORTED Hawaiian Shells—\$1.00. Alwin, Puhi-Kauai, Hawaii.

80 PERSONAL

"HOW Can I Find Out?" You Can! Information discreetly developed. Any matter, person, problem, anywhere. Worldwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 170 Broadway, N. Y.

GOLDEN Gate—Letters mailed 25c each. Caswell, 1252 16th Avenue, San Francisco, California.

BORROW by mail. Loans \$50 to \$300 to employed men and women. Easy, quick. Completely confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Give occupation. State Finance Co., 210 State Finance Bldg., Dept. E-14, Des Moines 8, Iowa.

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company, Box 7097-S, Cleveland, Ohio.

DETECTIVE'S Opportunities. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

CONFIDENTIAL information for single people, leading to happiness, romance. Write today! Dr. K. Miles, B.S., M.S., Ph.D., Human Relations Counselor, 601-G South Vermont, Los Angeles 5, Calif.

CONFIDENTIAL information for single persons. Copyrighted literature explains future happiness. Mailed Free upon request. Strone, Box 157-PS, New York 11.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

REACTIVATION to stay youthful by shedding infirmities. Revelation yours. Alfaia, 2606-P University Pl., Washington, D.C.

PERFUME! Wholesale! Guaranteed quality nationally advertised Perfume at 60% off! Rush 25c for wholesale price list, and we will send absolutely free, our regular \$1.95 package. Expect pleasant surprise! Elliott-Stuart Ltd., 4616 Hollywood Blvd., Hollywood, Calif.

PILES! Tormented with the irritation and discomfort due to piles? Write for free important information. Mutal Products, Box 836-P, Cleveland 22, Ohio.

SECRET of Persuasion, \$1.00. Dubois, 880 Churchill Rd., T.M.R., Montreal 16, Can.

PERSONAL problems analyzed; correspondence or conference. Please anticipate delay. August Cesare, Box 755, Youngstown, Ohio.

INCREDIBLE! Unprecedented! Become a mental superman overnight! Floor everybody! No studying! 'Memoprop' does all your thinking! It's uncanny! Revolutionary! Write: Bijou, Box 1727-VH, Hollywood 28, California.

HAIRCUT as you like it. Booklet tells how 25c. Mastrolia, 5½-BH Jane, New York City 14.

"INTERESTING Mails"—25c keeps your mail box full three months. Bents, Desk-E/8, Chatawa, Mississippi.

MEXICAN Law. General Practice Attorney, 1203 Arizona Street, El Paso, Texas.

SAVE your Hair. Registered Pharmacist offers time tested formula. Checks falling hair, dandruff, scalp itch. Details write S. Viggiano, 6556 Ladson, Pittsburgh 6, Pa.

FALSE Teeth tight, longer. Free facts. Veldent, 1439-F Underwood, Milwaukee 13, Wisconsin.

VALUABLE Big Mails, four months listing, 25c. Wright Publications, 2276-J Hubbard, Memphis 8, Tenn.

SUCCESS Simplified! Become a financial wizard; a mental giant; an athletic Superman; a romantic magnet; an expert in any field! Free literature. Success Society of America, Box 5852, Cleveland 1, Ohio.

INFORMATION for single people by Human Relations Consultant, Dr. B. Long, Box 375, Los Angeles 53, Calif.

PAPERHANGERS: Mix Mannatex Compound with paste. Prevents damp-mold, keeps wallpaper from cracking, makes it stick. Guaranteed Trial Size \$1.00 P.P. Paperhangers Supply Co., P. O. Box 37D, Louisville 1, Kentucky.

MIAMI Postmark. Letters remailed, 25c each. Drew, 25 Southwest 30th Court, Miami, Florida.

NEW York remail 25c; Havana \$2.00. Scenic cards 3 for 50c. Barzell, Box 221, 90 Church Street, New York 8.

STOP Snoring Scientifically. E. Hamilton's Easy Way Booklet \$1.00. Box 509, Kenosha, Wisconsin.

HONOLULU Remail 25c. K. Shirabe, 986 Robello Lane, Honolulu 17, Hawaii.

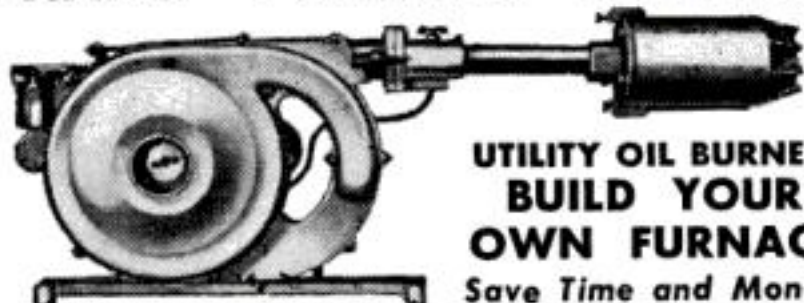
LETTERS remailed New York City, Brooklyn, Newark, 25c. Licht, 69 Valley Street, Newark 6, New Jersey.

U.S. OIL LEASES PAY OFF FIND WHAT YOU CAN DO FOR ~ \$200.

Congress has given any U. S. citizen the right to file for oil leases on certain public lands. Some U. S. oil leases have lately paid \$150,000 for under \$200; \$250,000 for \$250; \$137,000 yearly for \$200. We locate you a lease in a possible oil area. Scores of our clients have sold U. S. leases we obtained for them to major oil companies, keeping part of the oil for themselves. In California the estimated oil under 40 acres of OIL LAND is 2 million barrels. That is why you have a chance at enormous returns by risking \$200. Write for free booklet.

CALIFORNIA LEASE CO.
7075 HOLLYWOOD BLVD. LOS ANGELES 28, CALIF.

FIRING FORGING MELTING



**UTILITY OIL BURNER
BUILD YOUR
OWN FURNACE**

Save Time and Money

Do your own **HARDENING, TEMPERING, ANNEALING, BRAZING, BENDING, ASSAYING, FORGING, BAKING, CASTING, FIRING.** Cut costs tremendously. Complete instructions furnished for building kilns, forges, furnaces, with castable refractories. Burner converts kerosene, #1 and #2 fuel oil into a clean hot gas flame. Fires into open and into furnaces with controllable atmosphere. Up to 3000°F. A neat, compact, portable unit ready to operate. Burns ½ to 1½ gals. per hour; 50-200,000 Btu/hr. Wide heat range. 26" x 10" x 9"; 22 lbs; 110 v., 60 cycles. Write for complete information. Tell us your requirements. Immediate delivery. Price \$89.50 FOB factory. Satisfaction guaranteed.

STODDARD PRODUCTS CO., Inc., 66 Amity Road, New Haven 15, Conn.

NEW TOOL FOR SHOP AND HOBBY!

Swingline
Tot 50

**TACKER
STAPLER**

A precision-built Swingline tacker-stapler kit at a record low price! Sturdy!

Rust-proof! Durable!

Keep it fingertip handy on work-bench or in tool-box — it will save you plenty of time, work and money every day. Hinged plastic box and a big supply of staples!



1000
Refill
Staples 25c

Only 98¢
with 1000 Staples
and leaflet

Sold at Drug, Hardware, Stationery, Dept. and Variety stores everywhere.

SPEED PRODUCTS COMPANY, INC.
LONG ISLAND CITY 1, NEW YORK



IT TACKS!
screening, shelving,
insulation, templates.



IT STAPLES!
shop notes, blueprints,
holds wood while glueing.



IT MENDS!
tool rolls, bags, awnings,
leather, rubber items.



at 50% SAVINGS!

Magnify his or her enjoyment at sports...vacations... theater... EVERYWHERE! Bushnell Binoculars are designed to "keep on giving" — truly a gift of a lifetime — and lifetime serviced. Write today for beautiful, large, new "Money-Saving" catalog and Guide — BOTH Free! Local dealer on request.

30 DAY RETURN PRIVILEGE! MONEY-BACK GUARANTEE!

FREE—NAME
IMPRINTED on
genuine
leather case
in 24K
GOLD.



\$54.50*

\$150 VALUE!

7 POWER, 35mm All-Purpose

America's favorite... for the entire family. Compact: 4 3/4" x 5 3/4" Sharp clarity... High illumination • Hard coated lenses and prisms • Achromatic, color-corrected lenses • Field 37.5° • Featherlight Magnesium (17 oz.) — Defies comparison!

• New 8 x 30mm in same Shur-Grip design **\$39.50***



\$22.95*

Inc. case

\$65 VALUE!

33 ADDITIONAL MODELS!

EASY PAY PLAN

Overnight AIR MAIL SERVICE!

7 POWER, Palm-Pocket Size

A real HANDFUL OF POWER! Wt. 6 1/2 oz. All chrome. Field 37.5°. Size: 2 1/4" x 4". Achromatic, color-corrected 18mm lenses. BOTH lenses AND PRISMS hard coated. Startling value!

• 6 power x 15mm in same style **\$17.95***

FREE! XMAS CATALOG AND "HOW TO SELECT" BOOK

BUSHNELL BINOCULARS

Dept. P31 Bushnell Building, Pasadena 1, California



LEOPARD SEAT COVERS

SWEEP TO SENSATIONAL NATIONAL POPULARITY



Salesmen jamming pockets with \$1000 bills...

TAKING ORDERS FOR KEY EXPERTLY Tailored AUTO SEAT COVERS

7 Styles

BIG SEASON NOW STARTING!

You've heard of the tremendous demand for Leopard auto seat covers that built up overnight from one end of the country to the other when Cadillac introduced a new 1950 model with Leopard Seat Covers. Car owners are paying \$50.00 to \$60.00 and \$70.00... and more for covers with Leopard design. Now you can serve that eager demand at a fraction of the cost the customers expect to pay! No wonder salesmen are making money hand over fist with this sensational new Key line!

Make big money daily. Take orders from car owners everywhere. Beat all competition with covers cut to accurate

patterns like the finest suit of clothes... Slick, smooth, wrinkle-free fit adds an accent of elegance to any car... just like an original upholstery job!

RUSH NAME FOR FREE OUTFIT

Give Make, Year and Model Of Your Car. Anyone working full or spare time can realize big money in this business. No need to search for prospects. Every car owner is one. Be the first to cash in... Make year around STEADY PROFITS. Don't put it off — get your Free Selling Kit at once for some real money. ACTUAL SEAT COVERS GIVEN FREE TO PRODUCERS FOR OWN USE! Write for full details!

KEY PRODUCTS CORP.

Dept. 6-T
800 N. Clark, Chicago 10, Ill.

for hunting or decoration
famous antique
45-70 cal.
**ROLLING
BLOCK RIFLE**

\$1495

You'll want
the sword type
bayonet at only
\$2.50 extra

Limited quantity
— order today

FOB Los Angeles —
COD orders \$5 deposit

WESTERN ARMS CORPORATION

Dept. F11, 417 E. Pico Blvd., Los Angeles 15, Cal.

PLYWOOD BOAT KITS

\$97.00

(Freight included)



Build this 12-ft. sport run-about from ready-cut parts. Kits include all hardware, paint, etc., to complete the boat shown. Send for free folders of all models as low as \$32.00 freight included.

TAFT MARINE WOODCRAFT

Dept. S, 636 39th Ave., N. E., Minneapolis 21, Minn.

THROWING DAGGER \$2 postpaid

This MALAYAN FIGHTING KNIFE is used for self-defense, killing game, target skill. A powerful, silent, accurate weapon.

Splits 1" board at 30 ft.
BALANCED TO STICK!

Fun, Thrills, Excitement!

Indoors — outdoors.

Learn this Sport! Easy

to throw accurately with our

clear instructions. Beautiful, heavy-

duty 10" knife. Tempered steel. Tough,

rawhide-bound handle. Rare souvenir, unusual

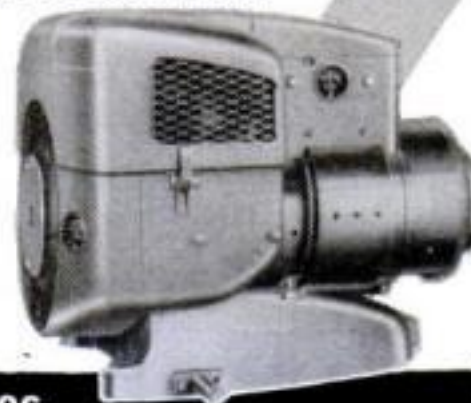
bargain. Limited quantity. Sold direct only. Send \$2

WHOLESALE IMPORT CO., Dept. 7, 604 S. Marengo, Alhambra, Calif.

ELECTRICITY Anywhere

FOR PORTABLE, EMERGENCY OR HOME USE

ONAN Electric Plants generate 110-volt, 60-cycle current for homes, farms, cabins and resorts beyond the highline. Lightweight, portable plants cut costs, speed work for contractors. Standby plants protect hospitals, homes, civil defense units against power failure. 400 to 55,000 watts. Gasoline or Diesel-powered. Priced from \$219.00.



WRITE FOR CATALOG

D. W. ONAN & SONS INC.

6733 ROYALSTON AVE. • MINNEAPOLIS 5, MINN.

NOW!

a new way of living at
AMAZING LOW COST!

IN A
COMPLETELY FURNISHED



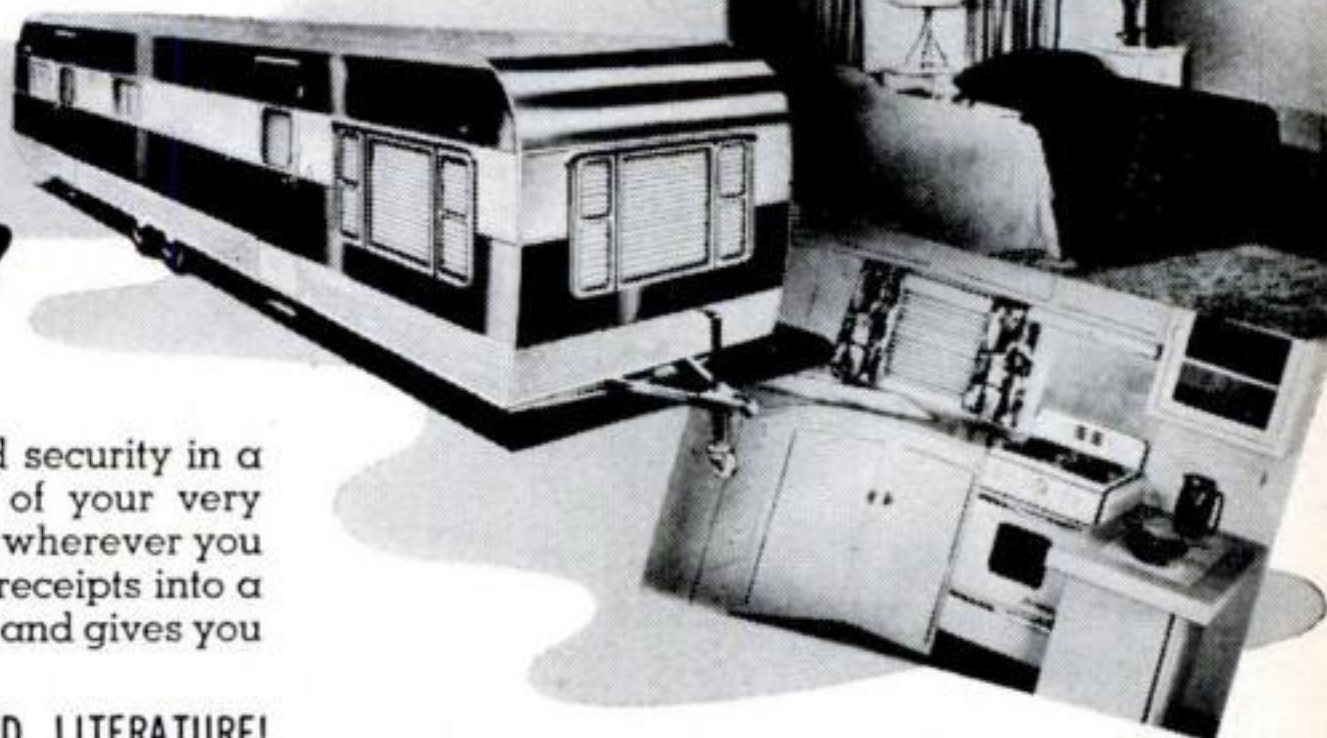
APARTMENT HOME

Here's luxurious comfort and security in a completely furnished home of your very own... a home you can take wherever you go, that turns worthless rent receipts into a safe investment for the future and gives you real home comfort today.

WRITE TODAY FOR ILLUSTRATED LITERATURE!



WRITE today for free illustrated literature and complete details on the special New Moon E-Z Payment Plan.



REDMAN TRAILER COMPANY
38 BRIDGE STREET, ALMA, MICHIGAN

SALESMEN!

**CASH IN WITH
HANDILITE**

**CONSUMER DEMAND
RUNNING WILD ON
1 SEC. DEMONSTRATION**

Revolutionary new invention brings new protection to motorists and money making opportunity without parallel for live Agents — Salesmen — Distributors. **HANDILITE** — flashing ON-OFF Safety Lantern ends danger of night accidents when car is parked for emergency repairs. Casts powerful 1,000-foot beam plus flashing red warning signal! 3 WAY ACTION. Red flasher only — both flasher and white beam — or beam light only at turn of switch. **MOTORISTS — FLEETS — SPORTSMEN — VACATIONISTS ALL WANT THIS SAFETY LANTERN ON SIGHT.**

FREE! DEMONSTRATOR OFFER. Huge profits in direct sales and to stores for resale! Get Sample Offer. Write TODAY!

The HANDILITE CO.
Dept. 18-T Sturgeon Bay, Wisc.

RED BLINKER

VISIBLE

1 MILE



NEED EXTRA CASH?

Rush Coupon for

FREE SALES KIT



Make Money spare time, full time, taking orders from friends, neighbors, and others for world-famous

STARK FRUIT TREES

Cash in now taking orders for Stark Bro's world-famous hardy Apples, Pear, Peach, Plum, Cherry, Quick-Bearing fruit trees. Sensational new U. S. Patented varieties—PLUS amazing new Stark "Dwarf" Trees to make selling easy. Boost earnings showing homeowners, others how to

**Teacher Sells
SPARE
TIME**



John W. Simmons, W. Va., has earned big money spare time during past 21 years selling Stark Fruit Trees, Shrubs, etc.

landscape beautifully with Stark Trees. Gorgeous Flowering Shrubs and Roses. Big demand. Get set now with America's largest, oldest nursery—136-year-old reputation for quality and reliability.

SEND NO MONEY Get Giant FREE Outfit! Mail coupon today for big demonstration outfit, beautiful Full Color Photo Plate Book, and instructions. No experience needed. Big season starting—ACT NOW!

STARK BRO'S Dept. 2952, Louisiana, Missouri

STARK BRO'S Dept. 2952, Louisiana, MISSOURI

Please RUSH FREE Sales Outfit. I am ready to make money!

NAME _____ PSM11-51

ADDRESS _____ COUNTY _____

TOWN _____ STATE _____

NOVEMBER 1951 89

SHAVES A WEEK'S
GROWTH SLICK
AS ONE DAY'S



Whisker THE SHAVER

THAT CONVINCED THE BARBERS

Many Barbers use a *Whisker* to shave themselves and recommend it to customers. *Whisker's* refined hair-clipper action and .002" thin blade removes 1 to 7 day beards clean and close. Fast ... 14,400 strokes per minute. Quiet ... operates on 110 v., 60 cycle AC. No TV or radio interference. Women like *Whisker*, too, for safely removing superfluous hair on legs and under arms. Get *Whisker* at your Barber or Dealer.

ELECTRO TOOL CORPORATION
DEPT. W531-L, RACINE, WISCONSIN

See your Barber or Dealer. If he cannot supply you,
USE THIS COUPON TO ORDER

ELECTRO TOOL CORP., Dept. W531-L, Racine, Wis.

☐ Enclosed find \$15.95 (check or money order).
Send *Whisker* POSTPAID.

☐ Enclosed find \$5. Send *Whisker* C.O.D.
I'll pay postman balance plus postage.

Name _____

Address _____

City _____ Zo. _____ State _____

WORLD'S FASTEST BOATS!

BUILD and DRIVE your own high speed racing boat



as hundreds of others are doing! Easy to follow our simplified plans for newest types of racing craft. Large selection of full race Hydroplanes ranging from 6 ft. to 20 ft. lengths. Service, Racing, Utilities, and 3 Points. Both inboard and outboards.

SEND 25c for CATALOGUE

containing pictures and descriptions of *Champion Boats* for which plans are designed and distributed exclusively by **CHAMPION BOATS**, P. O. Box 9038, Dept. 18-K, Long Beach, California, U. S. A.

NEW LEVER-LOCKING TRAILER HITCH

TEXHITCH is a new lever-locking trailer hitch that is easy to operate, safe, and long-lasting. Just raise or lower the handle to couple or uncouple.

TEXHITCH stays safe and easy to operate despite rust, wear or grit.

6000 lb. load capacity makes it ideal for boat, farm and industrial trailers. Remit with order, we pay postage. C.O.D., you pay postage. Perfect gift.

TEXAS FOUNDRIES
LUFKIN, TEXAS



ONLY
\$8.45

ELECTRIC MOTOR BARGAINS!



1/2 HP 1750 RPM	1975	3/4 HP 1750 RPM	3200
1/2 HP 3450 RPM		1 HP 3450 RPM	4750
1 HP 3450 RPM	3900		

Every Motor Fully Guaranteed

Heavy Duty, Repulsion Induction and Capacitor Types, 110-220 Volts, 60-cycle, Single-phase. Standard Makes (G. E., Wagner, Lealand, Westinghouse, etc.). Rush your order TODAY—large stock of motors—1 & 3 phase. 32-v. direct current bargains. Prices f.o.b. **ROBERTS ELECTRIC CO., 849 W. Grand, Dept. 15, Chicago**



LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid.

FLYING DUCK

Wind revolves wings. Realistic appearance. Pattern, Instructions and wing Pinion Kit: brass bearing, steel shaft, wing lugs, bolts, nuts and washers. 50c. Pattern and Instructions without kit, 25c. Postpaid.

Dept. 7-CG

STROTHER PATTERN SERVICE
Box 128

Belington, W. Va.



TALK—SING—PLAY OVER YOUR RADIO

with the real Radio Mike! Attaches in a jiffy—full instructions given! Swell for "parties"—"cut in" on or "kid" regular network programs or put on your own broadcasts! Amaze your friends—real fun. Beautiful Metallic Plastic 6 in. high!

12 RADIO BROADCAST LESSONS GIVEN with each mike
SEND NO MONEY Just pay postman \$3.99 COD plus postage or send \$3.99 and we pay postage! *Radio Mike* is available only from us by mail—guaranteed.

Midway Co., Dept. MPS-11, Kearney, Nebr.



REAL LEATHER NAVY HELMET

NO HOOKS, TUBES OR HOLES

Brand new NAVY helmet of rich Cordovan Brown leather lined with soft warm fleece. Detachable chin strap. Ideal for flyers, cyclists, farmers, hunters. Children love them! Cost Gov't. \$10.00. Small, medium, large sizes. Send cash, chk, 25% dep. plus postage on COD. Money back guarantee. **\$2.00 pp.**

GRAND-HAWTHORNE SURPLUS
1439 S. E. Grand, Dept. PS11-51, Portland, Ore.



"It Measures As It Rolls"

ROLLER RULE

HANDY MECHANICAL PENCIL

\$1.29
POST PAID

Measures Curves and Straight Lines. Any Shape. Any Distance. Any Surface.

Roll head over surface. Inches and fractions record accurately on "Inch-O-Meter". Excellent pencil too! Order Now! **10 Day Money Back Guarantee!** C.O.D. (postage extra). In Calif. add 3% Sales Tax.

PENCIL SALES CO., Dept. PS-11
Room 6, 1213 E. Ocean Blvd., Long Beach, California

- LONG 10" BARREL... FOR HIGHEST ACCURACY (On Single-Shot & Repeater models)
- REPEATER MECHANISM... FASTER, EASIER SHOOTING (On 6-Shot Repeater model)
- INTERCHANGEABLE BARRELS... SHOOT 5 TYPES OF AMMO, PELLETS, DARTS, BBs (On Sportster model)

At Your Dealer, Or Write For Booklet
HY-SCORE ARMS CORP.
 25 Lafayette St., Bklyn. 1, N.Y.

WHAT FEATURES DO YOU WANT IN AN AIR GUN?



* ILLUS. 6-SHOT REPEATER MODEL

NO PERMIT REQUIRED

FELLAR YOU WANT **HY-SCORE**
 THE ONLY AIR GUN WITH SO MANY EXCLUSIVE FEATURES!

Mustang

LIGHTWEIGHT
\$362.20

9.5 hp. 4-cycle. 3-speed. Foot-shift. Over 70 miles per gal. Over 60 m.p.h. Write for free circular.

MUSTANG, Dept. PS

635 W. Colorado, Glendale 4, Calif.



(Fed. tax paid, at factory)

GROW MINIATURE TREES

FOR PROFIT & PLEASURE



Fabulous Money—Real Fun! Grow genuine live dwarf (Ming) trees. A terrific new business and hobby. Astounding details Free. Write —

DWARF TREES, Dept. 12

P. O. Box 355 • Briggs Station
 Los Angeles 48, California

\$750 BUILDS 4 ROOMS & BATH! WHY PAY RENT?



For Seven Hundred Fifty Dollars and 30 days of your spare time, you can build yourself this Beautiful Home.

Living room 11x15, Front bedroom 9x11, Back bedroom 10x12, Kitchen 9x11, Bath 5x8, Hall 3x4, Wind out steel casement windows, Concrete block, stuccoed. \$1.00 brings you Step-by-Step Instructions, Blueprint & Material List.

L. H. FARROW, Dept. D
 Box 645 Columbus 16, Ohio



SPORTONE MUFFLERS

Ford & Chevrolet.....\$ 4.45

All other popular cars..... 5.45

V-8 Dual Sets..... 15.95

Chromed Silents..... 2.95

(Please state make & year of car on all orders.)

SANDEE MUFFLER CO.

5643 Corryne Place • Culver City, California



Free Fall Catalog

Fully illustrated. 96 pages, showing Hunting Footwear, Clothing, and fifty-two other leather and canvas specialties of our own manufacture for campers and hunters.

L. L. Bean, Inc.
 298 Main St.
 Freeport, Maine

TREAT

your car to

PYROIL

Treat your car to Pyroil—and treat yourself to improved lubrication, less maintenance and added miles.

Pyroil contains the special property of making oil adhere to important engine parts. It prevents friction between piston rings and cylinder surfaces. Pyroil means easy starts. Pyroil cleans your motor and keeps it clean.

Your favorite service station has Pyroil. Next time you stop for gas or oil—treat your car to Pyroil—treat yourself to added miles for your car.

Pyroil for Aircraft Engines

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

GIVEN! An attractive Pyroil metal savings bank, takes coins up to 50c pieces. **MOTORISTS**, it's yours for the asking—sent postage paid.



Manufactured and Guaranteed by
Pyroil Company,
 591 Main Street,
 La Crosse, Wisconsin.

Canadian Distributors:
Central Purchasing Agencies, Ltd.
 Toronto, Ontario

PYROIL COMPANY

591 Main Street, La Crosse, Wisconsin

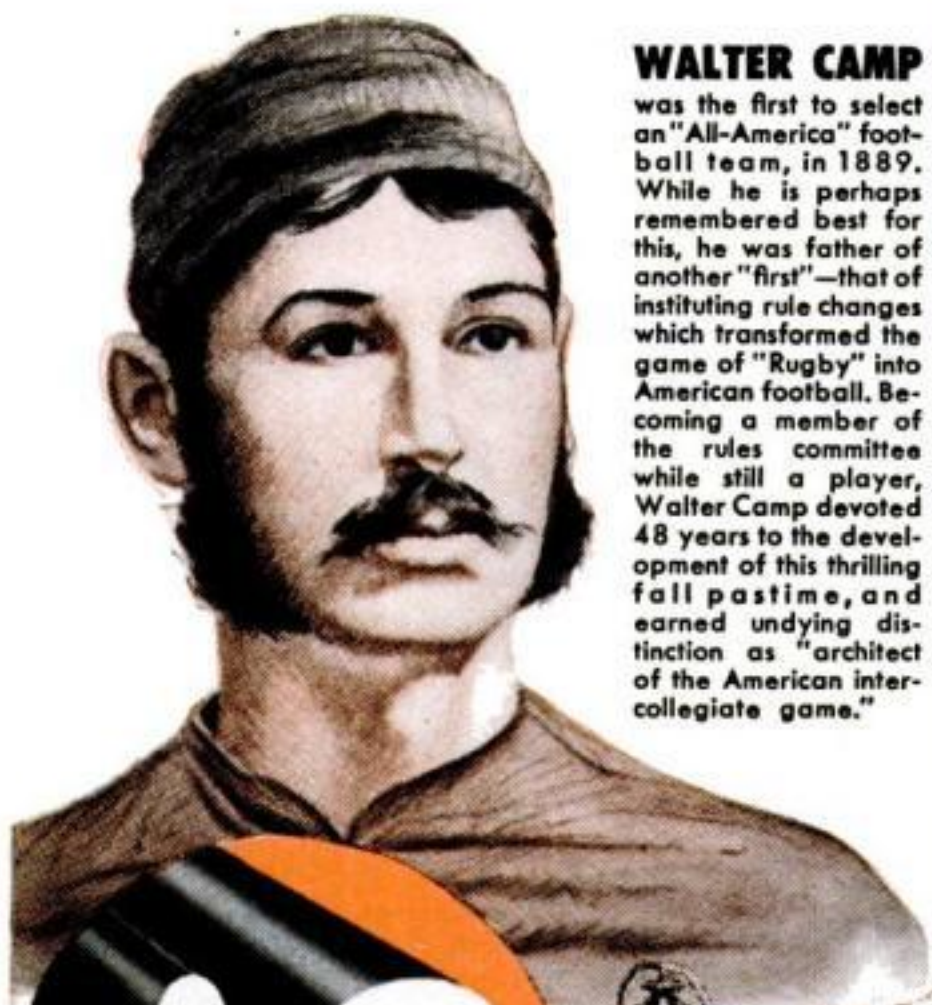
I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

Name.....

Address.....

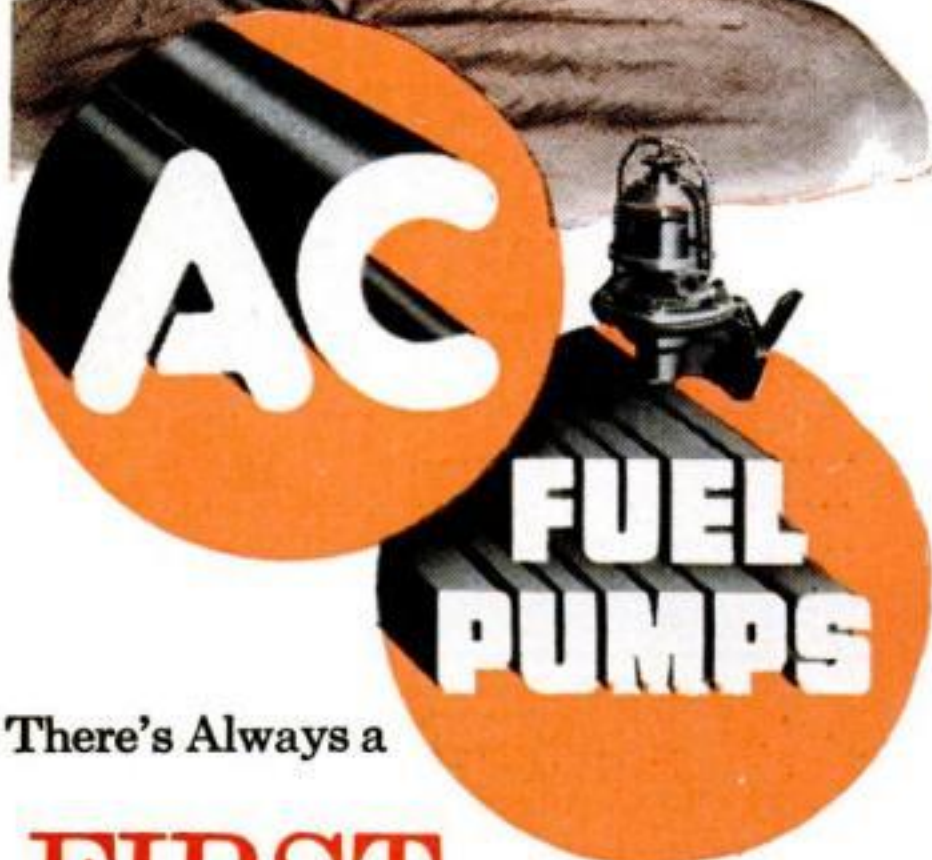
City or Town.....State.....





WALTER CAMP

was the first to select an "All-America" football team, in 1889. While he is perhaps remembered best for this, he was father of another "first"—that of instituting rule changes which transformed the game of "Rugby" into American football. Becoming a member of the rules committee while still a player, Walter Camp devoted 48 years to the development of this thrilling fall pastime, and earned undying distinction as "architect of the American inter-collegiate game."



There's Always a

FIRST...

AC originated the fuel pump, 24 years ago. It soon became "All-America," supplanting other types of fuel supply systems.

More than 100,000,000 AC Fuel Pumps have been built.

More than 40,000,000 AC Fuel Pumps are in daily use.

The AC Fuel Pump is still "All-America." More than 90% of the gasoline-powered vehicles now in service were factory-equipped with AC's—the quality fuel pump.

AC SPARK PLUG DIVISION



GENERAL MOTORS CORPORATION

America's FIRST and FINEST Fuel Pumps

Crosman

"CO₂ POWERED" GUNS



.177 and
.22 cal.
models

Power
Without

Powder... Without Pumping!

Expert or beginner, you'll get a thrill without a "kick" shooting these amazing guns. Safe to shoot indoors or out, thanks to Crosman's "no-ricochet" type Super-Pells. Available in .177 and .22 cal. models. See them at your Crosman dealer's. Write for literature.

CROSMAN ARMS CO., Inc., ROCHESTER 20, N.Y.

NEWLY INVENTED ADDING MACHINE DIALS like a PHONE

- Fast • Accurate • Dials the Answer • Adds and Subtracts up to a Million • A Ruler • Flat • No Moving Parts • Fully Guaranteed • Fits in Pocket or Purse • Nothing to Learn. Start Using Right Away.

MINI-ADD

DEPT. PS-11
108 5th Avenue
New York 11, N.Y.



EASY TO CARRY

A Midget in Size...
A Giant in Performance

POST
PAID

BULL DOG HITCHES



Heavy Drop Forge Steel Construction. Strong — Safety-Engineered Reliable

Model No. 1-B
NOW ONLY
\$4.95
Post Paid (when
paid in advance)

Made for trailers with up to 2,500 pounds capacity.

1 3/4" dia. shank

Fits 1 1/4" pipe tongue

HAMMER BLOW TOOL COMPANY

Wausau 14K, Wisconsin

PACKAGED BOAT KITS

LARGEST CATALOG
EVER OFFERED!

16 pages—80 construction and action photos PLUS specifications and performance data.

\$38.95 UP



COMPLETE LINE — SKIFFS, OUT-BOARDS, RACERS, CRUISERS. 23 Models! Kits, Semi-finished and Custom-finished boats, hardware, paint.

SEND 35c FOR BOAT CATALOG

BOAT CATALOG PLUS booklet on boat building, \$1.00

BOAT PATTERNS-BLUE PRINTS

Over 70 modern plans and full size patterns. Racing classes, cruisers, inboards, outboards, sail boats. By famous designers, 6' to 30'. DESIGN CATALOG 35c. DESIGN CATALOG and boat building handbook, \$1.00.

MARINE MART-DEPT. 52-BUFFALO 7, N.Y.

YOU GET MORE FOR YOUR MONEY WHEN YOU BUY A HARLEY-DAVIDSON

It could be you...HAPPIEST MAN IN '52!

Ride the finest of them all
1952 HARLEY-DAVIDSON
HYDRA-GLIDE®

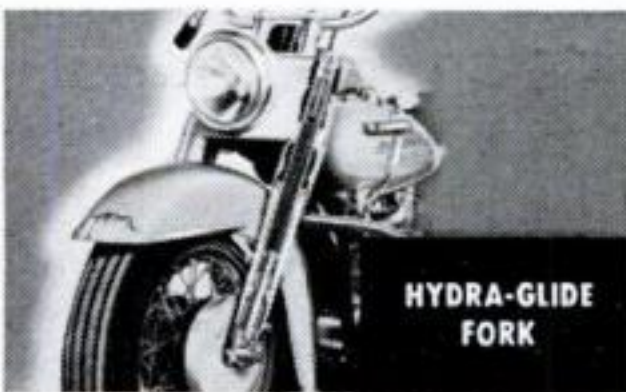


This is *your* baby . . . a dream on wheels!
So thrilling! A touch of the throttle and you're off like a comet. *So dynamic!* Steepest hills vanish beneath you. *So smooth!* Roughest roads level out like boulevards. *So comfortable!* Far-away places seem only minutes away. Dozens of engineered advancements feature this 1952 model, including 4-speed foot shift-hand clutch, power-boosting, low-toned muffler, Parco-lubricized valves, flatter, wider tread tires for longer life and smartly colorful styling. Plan now for happy days ahead . . . for a happier *you* in '52. See and ride, this newest, finest Harley-Davidson. Now on display at your local dealer.

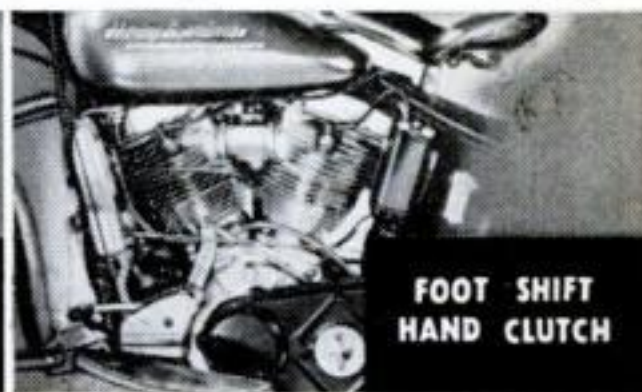
Most Powerful! Most Comfortable! Easiest to Handle!



OVERHEAD
VALVE V-MOTOR



HYDRA-GLIDE
FORK



FOOT SHIFT
HAND CLUTCH

MAIL THIS COUPON HARLEY-DAVIDSON MOTOR CO., Dept. PS, Milwaukee 1, Wis.

Send me free copy of ENTHUSIAST Magazine filled with motorcycle action pictures and stories; also literature on 1952 models.

Name.....

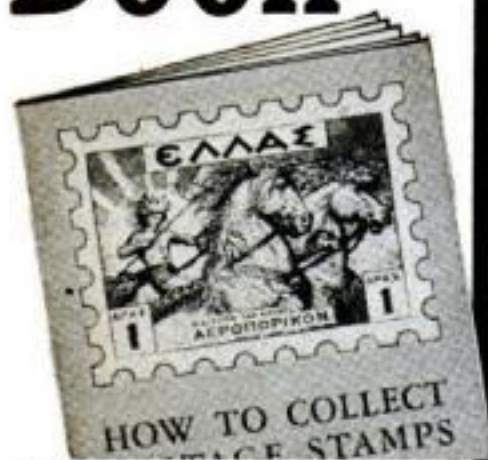
Address.....

City.....State.....

DEALERS WANTED: A few valuable franchises still available for the full line of famous Big Twins and the 125 Model. Write today.

NOVEMBER 1951 93

MAIL COUPON FOR Free Stamp Book



LITTLETON STAMP CO.
Dept. PS-11, Littleton N. H.

Rush me a FREE COPY of "How to Collect Postage Stamps."

Name.....

Address.....

City..... State.....

WORLD'S TINIEST LIGHTER!



**Smaller than a
POSTAGE STAMP**

Covered with Genuine Reptile Leather!
Initialed in Gleaming Chrome!
Nothing like it for gifts and personal use! Imagine—a mechanically-perfect lighter that's actually smaller than a postage stamp. DEFINITELY NOT A TOY—but a precision-made, imported lighter that rivals the most expensive in quality and workmanship. Built like a fine watch. Friends will gasp with amazement when they see it... thank you a thousand times when you give it. Covered with reptile leather, initialed in chrome. Built-in eyelet for use on charm bracelet as brooch, or scatter pin. Uses regular fuel & flint. **Order today—quantities are limited.** Send \$1 per lighter with order, save 65c initial & postage (see left). Money refunded if not delighted.

SAVE 65¢! Send only \$1 with order & Initialed Lighter is shipped postpaid, fully guaranteed. Order C.O.D. and pay postman \$1.25 plus 40c postage \$1.65 for each Initialed Lighter \$1.00 plus 40c postage \$1.40 for each Plain Lighter

DRESDEN ART WORKS, Dept. 318
169 W. Madison St., Chicago 2.

SHOOTS LIGHT 1/4 MILE!

12-VOLT

It's brand new—powerful (12-volt, 1500 ft. beam). Adjustable, all-chrome head. Uses two 6-volt lantern batteries. Total weight only 5-1/4 lbs.! At hardware, sport, and electrical stores.

Delta

ELECTRIC CO.
Marion, Ind.

POWER-KING

**12-VOLT ELECTRIC
LANTERN**



only \$6.50 less batteries

32 Pages of Fascinating Stories. Expert Advice on Collecting. Pictures Galore!

Mail coupon AT ONCE to get FREE COPY of "How to Collect Postage Stamps."

FASCINATING STORIES: How a 1c stamp sold for \$1.50 later was bought for FORTY THOUSAND DOLLARS... how a printing error brought one collector \$15,000. Other thrilling stories.

EXPERT ADVICE on where and how to get stamps... how to tell their real value... how to mount, trade them... how to start a stamp club... 3 exciting stamp games.

FULL PAGES OF STAMPS PICTURES show native men and women from tropic and arctic lands, deserts, seas; ferocious beasts; airmail, etc.

**Book Sent To Get Your
Name for Our Mailing List**

ABSOLUTELY FREE to anyone interested in stamps. **OFFER MAY NOT BE REPEATED.** Rush coupon to get free book and also other interesting offers for your inspection.

Littleton Stamp Co.
Dept. PS-11, Littleton, N. H.

Interested in GUNS and SHOOTING?



The **AMERICAN RIFLEMAN** will give you a wealth of information about guns of all types: rifles—pistols—shotguns, foreign and domestic; sporting and military; modern and antique; the best calibers and loads; the proper iron and scope sights for maximum accuracy; detailed "how-to-do-it" information on reloading and gun remodeling; experienced technical advice on new equipment, accessories and gadgets. Every 96-page issue is pack-jammed with interesting and helpful information—exclusively about guns and shooting.

Send \$4.00 for subscription to 12 monthly issues—and receive two past issues, free. And for no extra cost you can become a member of the NRA, along with a quarter million other sportsmen! Full price refunded if not satisfied after receiving first three copies. (If you prefer, just write "Bill Me"; invoice will follow.)

NATIONAL RIFLE ASSOCIATION
1607-C Rhode Island Ave., N.W., Wash. 6, D. C.



The FIFTH Essential Instrument HULL AUTOMOBILE COMPASS

Like your other important instruments, a Hull Automobile Compass gives you... quickly, easily, accurately... a vital fact about your car—the **DIRECTION** it is going. Know your way, anywhere, with a Hull. Proved dependable for 18 years.

Write for local dealer's name and free literature.

HULL MFG. CO.
P. O. Box 246-E11, WARREN, O.

BeaconLite \$6.95
Illuminated
STREAMLINE \$4.95
Standard (not illus.)

BOAT KITS—26 MODELS EASY TO BUILD

ROWBOATS — OUTBOARDS
INBOARDS — CRUISERS
ENGINES — CONVERSIONS
ACCESSORIES — PAINT CHARTS



NEW CATALOG Only 35c, SEND COIN TODAY
U-MAK-IT PRODUCTS 703R-WHITTIER ST.
Bronx 59, N.Y. City

Exhibit this authentic model!

Douglas SKYROCKET

Wingspan, 4 1/4"
Fuselage, 8 1/2"

Realistic Jet-Rocket solid-wood model, all parts ready-shaped for quick assembly. Complete with full-color decals, plastic canopy, and display stand, 69¢. At your hobby dealer.



StromBecker

Send for free circular describing all models.

STROMBECK-BECKER MFG. CO.
Moline, Illinois • Dept. PS-11



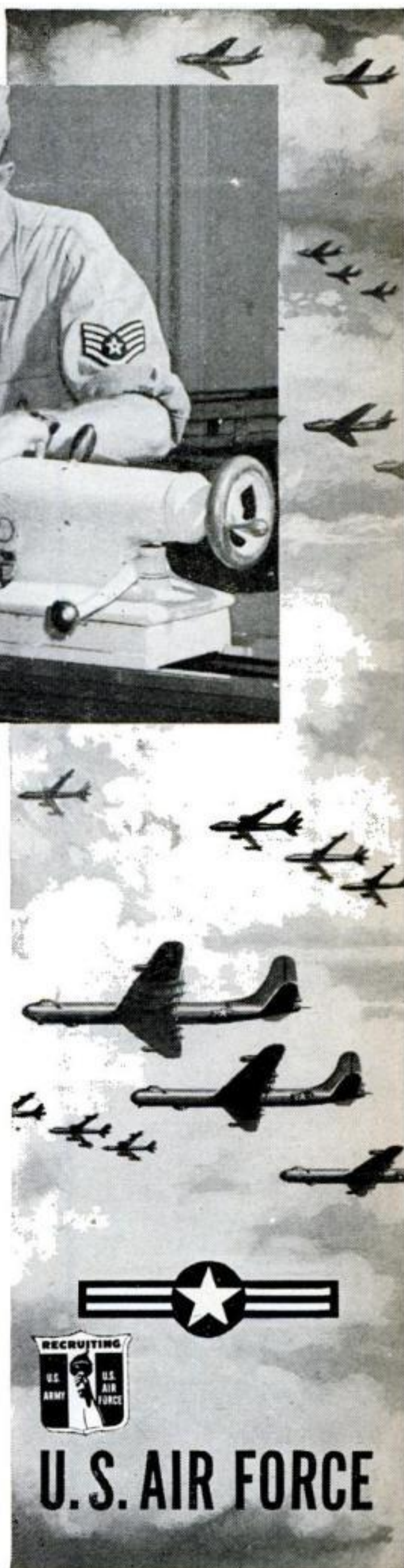
Accent on Opportunity

Until recently Private First Class Myron Jarman of Beverly Hills, California, was a student at Santa Monica City College and U.C.L.A. One day he read of the 45 career fields in the U. S. Air Force training program, and recognized his chance to combine his interests and aptitudes in creating a responsible job for himself.

Soon after enlisting he became a student machinist. In the photo, he is "blanking out a lathe model." Under his instructor, Staff Sergeant Albert D. Clark of Loveland, Colorado, Airman Jarman will learn mechanical drawing, blue print reading, use of small hand tools, lathes, milling machines, contour machines, shapers, heat treating and grinding.

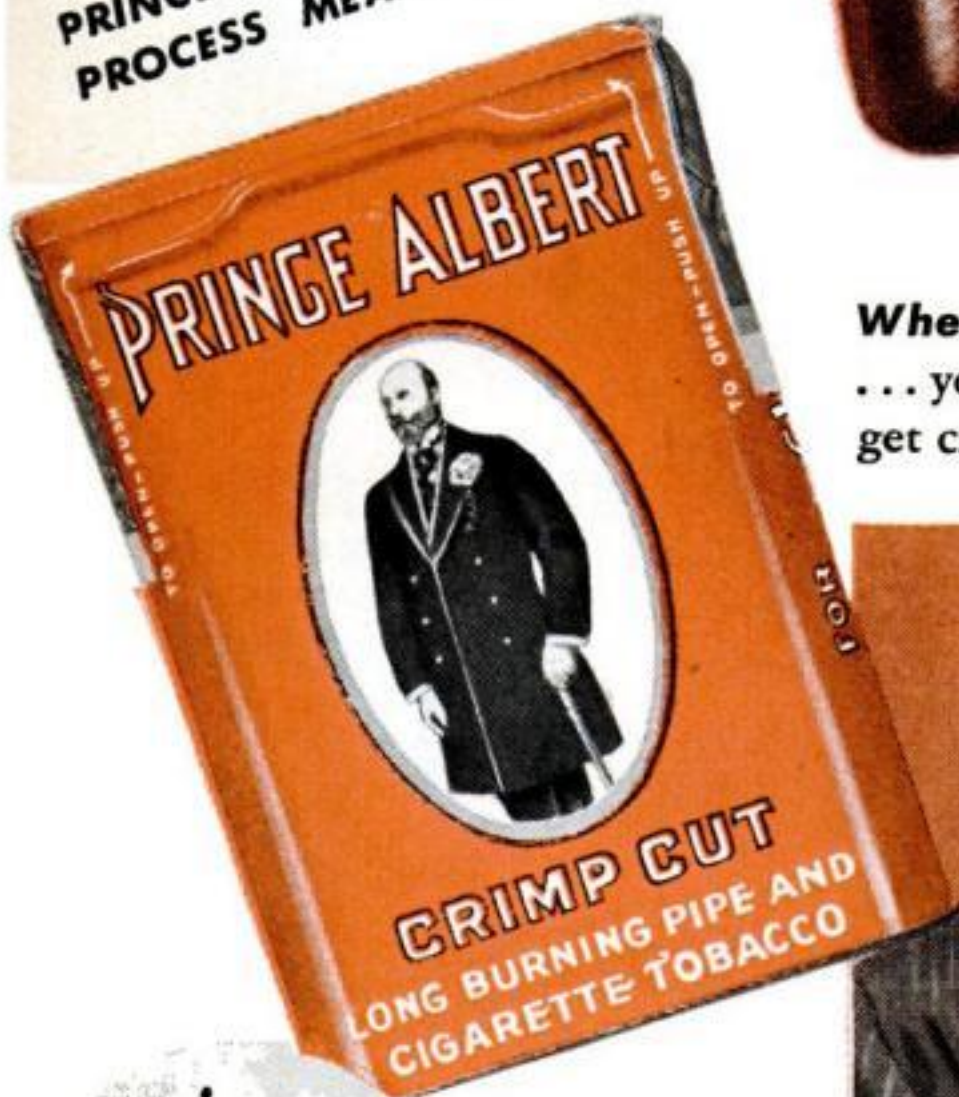
After 21 weeks of school, Myron will be an apprentice machinist. As he advances in experience and ability, his rank and pay will increase. He can find a vital and interesting career in the U. S. Air Force.

You, too, can have this opportunity! You can earn while you learn, in the field where you qualify. Find *your* place in one of the more than six hundred job specialties in the Airman Career Program. For details visit your nearest U. S. Army and U. S. Air Force Recruiting Station.



Bite's Out Pleasures In

PRINCE ALBERT'S PATENTED* "NO-BITE"
PROCESS MEANS REAL PIPE COMFORT



Whether you smoke a pipe or roll your own
... you're missing a real smoking treat until you
get crimp cut Prince Albert.



P.A.'s choice tobacco
is specially treated to
insure against tongue
bite... is rich tasting
and mild. It's a favor-
ite with pipe smok-
ers, and men who
roll their own, too!

*Process Patented July 30, 1907

*the
National
Joy Smoke*

MORE MEN SMOKE

Prince Albert

THAN ANY OTHER TOBACCO

R. J. Reynolds Tobacco Co.
Winston-Salem, N. C.

Popular Science

Highlights

This Month



Starting a balky engine on a cold winter morning can be a mean job—if you don't know how. Find out ahead of time why engines balk and what you can do about it. **Page 189**



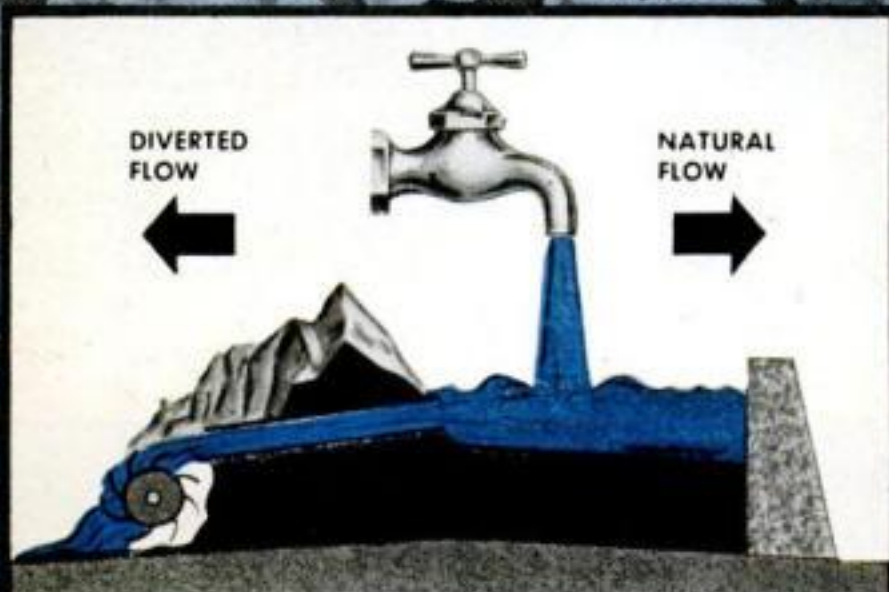
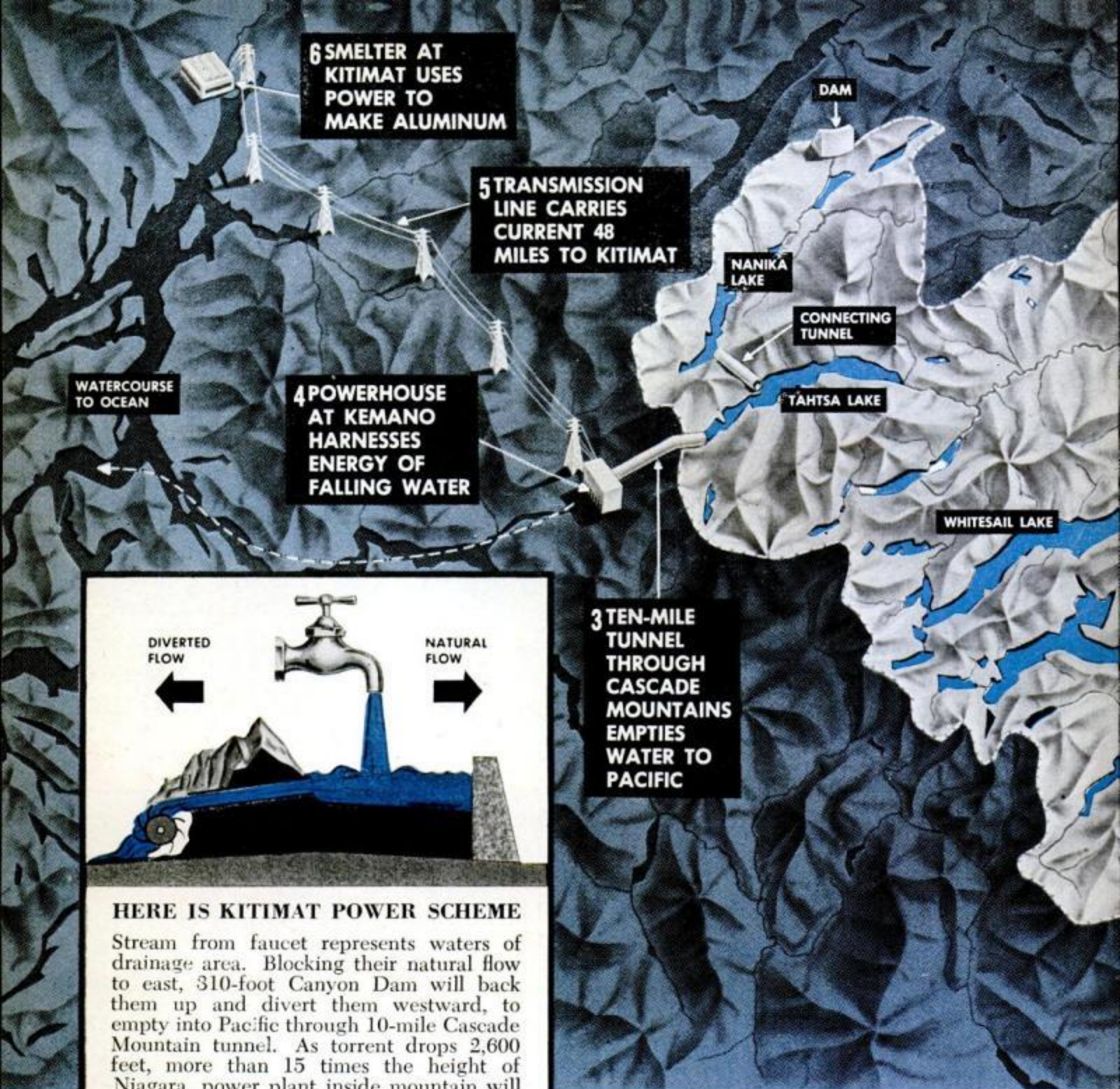
Wilbur Shaw tries out the Hillman Minx. But don't let that speed sign fool you: He reports the little British car cornered fine at 60 on the Indianapolis Speedway. **Page 124**



Green lumber can save you money if you know how to use it. Dried in your back yard or even nailed up to cure in place, it can do the job of expensive, commercially seasoned lumber. **Page 177**



This oil-seeking geologist is one of the men sparking a great industrial boom in wild northwestern Canada, where a vast power project will help make aluminum in a frontier fishing village. **Page 98**



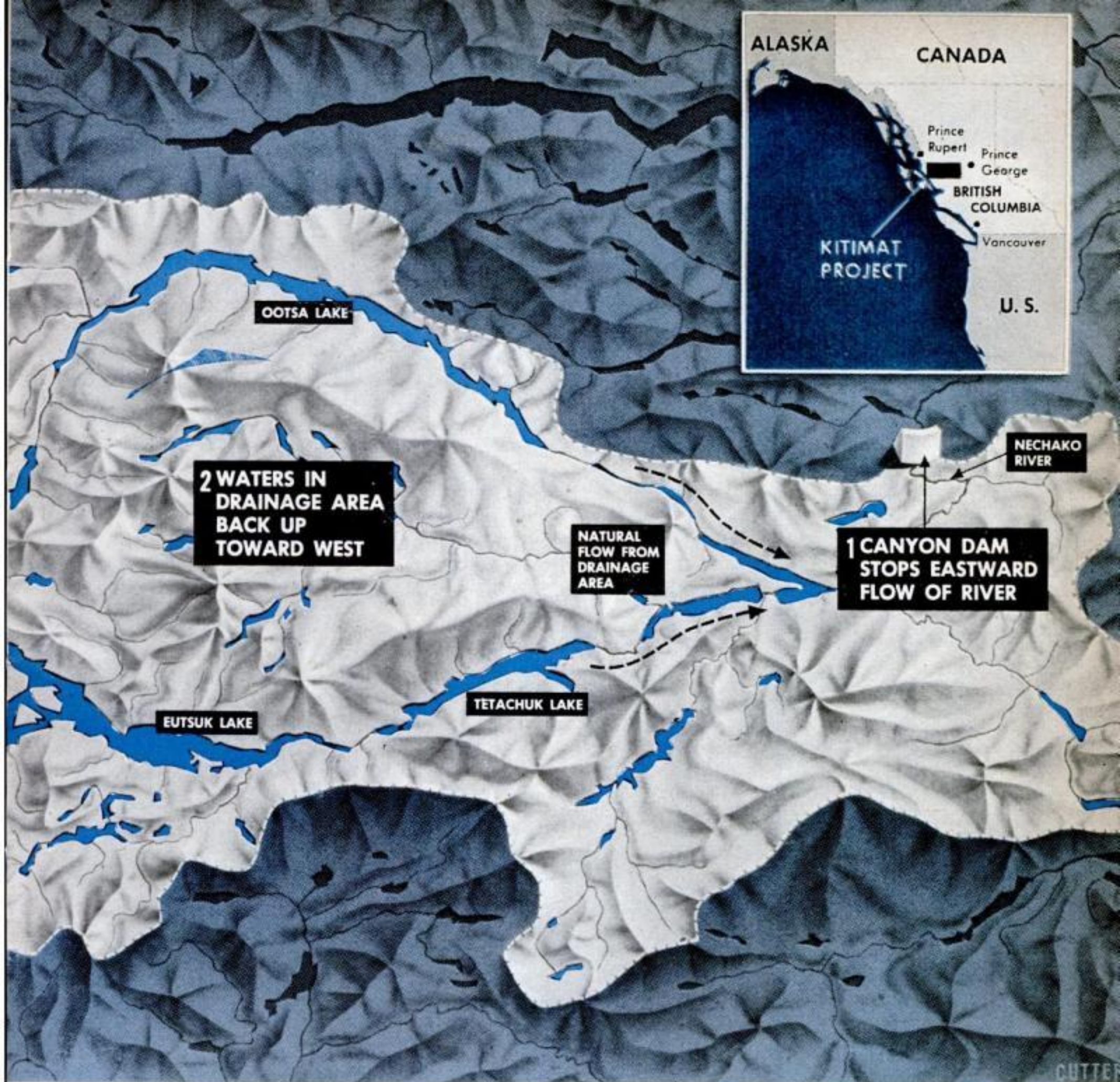
HERE IS KITIMAT POWER SCHEME

Stream from faucet represents waters of drainage area. Blocking their natural flow to east, 310-foot Canyon Dam will back them up and divert them westward, to empty into Pacific through 10-mile Cascade Mountain tunnel. As torrent drops 2,600 feet, more than 15 times the height of Niagara, power plant inside mountain will develop up to 1,600,000 horsepower.

World's biggest aluminum smelter at Kitimat, British Columbia, will draw power from mighty

Engineers Invade Another Wilderness

Huge Canadian power project marks 20th Century frontier boom.



hydroelectric plant at Kemano, where diverted waters of light-shaded drainage area will be

harnessed. Location of territory shown above is indicated by black oblong on inset map.

By Richard L. Neuberger

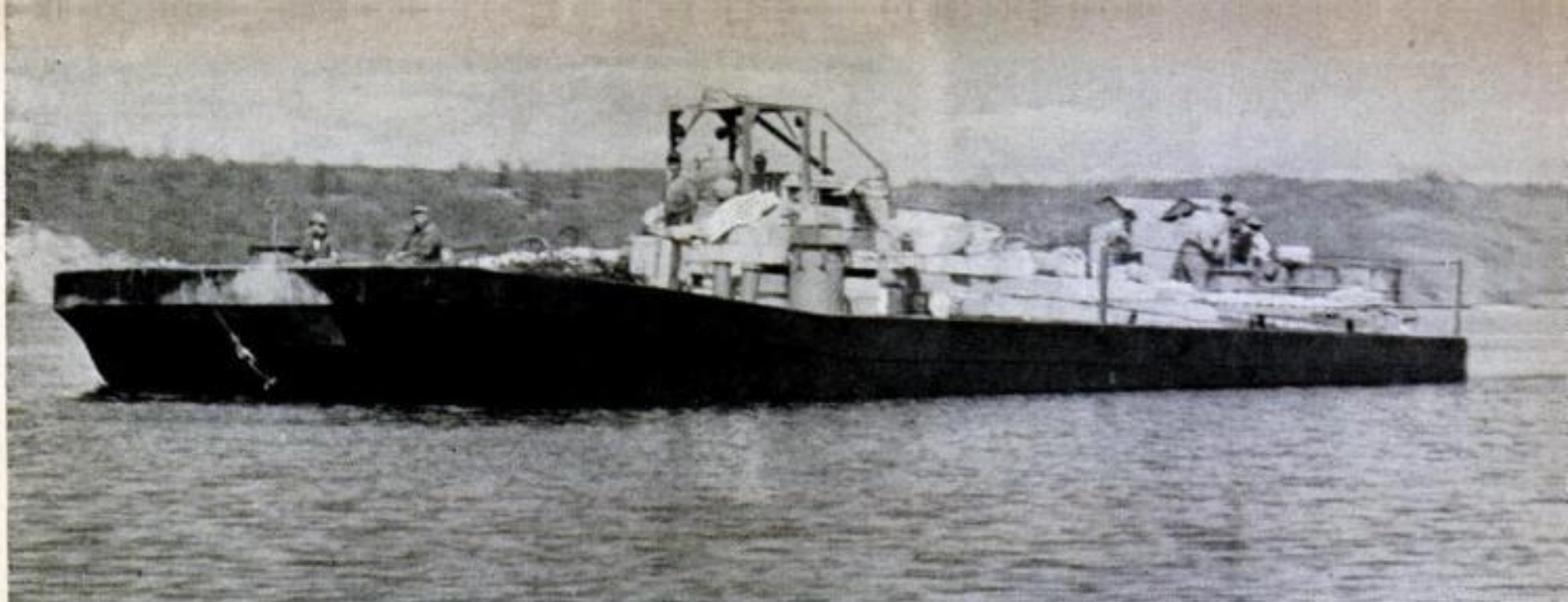
IT'S like the old gold-rush days again. Boom towns. Adventurous men carving civilization out of the wilderness. But not for gold this time. Now they are after commoner yet more valuable things—electricity, wood, minerals and oil.

Can 230,000-volt transmission lines be erected on glacial ice and silt? A year of difficult tests has proved that they can. As a result, engineers now plan to reverse the flow of a chain of huge wilderness lakes in the uplands of British Columbia and thus

produce more water power than the Bonneville, Shasta and Muscle Shoals projects combined. These transmission towers will carry power to the world's largest aluminum smelter.

This prodigious feat, undertaken by the Aluminum Company of Canada, will be the biggest hydroelectric project ever financed with private capital. It will generate more electricity than any other plant in operation except Grand Coulee Dam.

Soon the Nechako River, which few but the hardest men have ever navigated, will be plugged with a dam 310 feet high and



Steel barges like this one, starting a trip up Ootsa Lake and Tahtsa River, furnish transpor-

tation through the wilderness to site of water-diverting tunnel for the Kitimat power project.

1,350 feet long. This dam will generate no kilowatts, but will back up the flow of many large lakes that feed the Nechako.

Since the glacial sheets of the Pleistocene Epoch, these lakes have discharged eastward, into the Fraser River watershed. But Canyon Dam on the Nechako will impound them in a reservoir lapping against the Coast Range, off to the west.

At the most westerly lake, wind-rippled Tahtsa, a tunnel 10 miles long will be punched through the mountains. The tun-

nel will drop the water 2,600 feet to sea level at the head of Kemano Fiord.

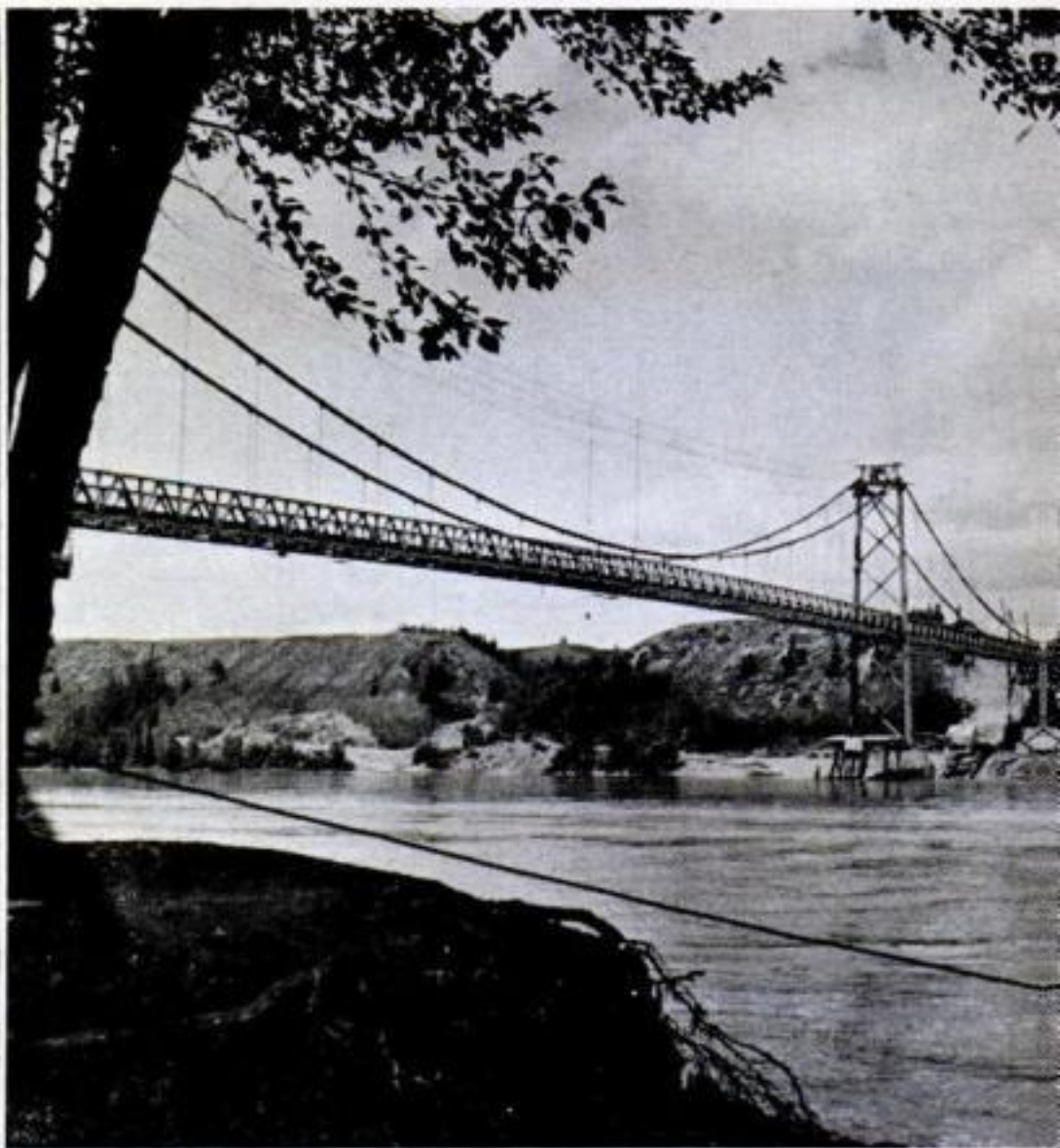
In a vast man-made cavern inside the granite cliffs at Kemano, a hydroelectric plant capable of producing 1,600,000 horsepower will be built.

Since there is no room at cramped Kemano for a factory, the electricity will be transmitted 48 miles across mountains and over glaciers to Kitimat, at the end of a more spacious fiord.

Kitimat is now an Indian fishing village.



Test transmission tower is erected on rock left behind by glaciers in Coast Range between Kemano and village of Kitimat, where a 48-mile line will carry power at 230,000 volts.



Alaska Highway leaps Peace River on graceful suspension bridge at road's starting point in British Columbia. Span is being strengthened for increasing traffic of new industrial boom.



Aluminum huts shelter workers on project to produce more aluminum. Men at "Thirty-Mile-

Camp" (above) are building a road to site of projected 310-foot-high dam on Nechako River.

Eventually it will be the site of the largest aluminum plant in the world, with a capacity of more than 500,000 tons a year.

In some places the ice has been blasted away so that the steel transmission towers can be concreted directly on the lava rock below. Elsewhere the uprights can be sunk all the way through the glacier to a firm foundation.

The whole undertaking will cost the Aluminum Company of Canada an ultimate \$500,000,000. Yet power costs at Kitimat

will be only one cent for each pound of aluminum. Power costs nearly three times as much at some of the new plants along the Gulf Coast in the United States. And electricity is the principal factor in the production of aluminum.

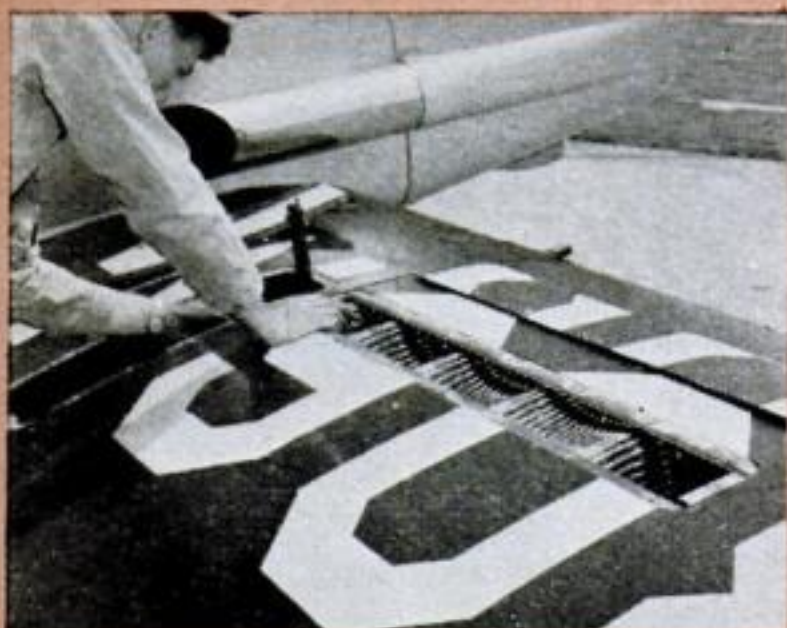
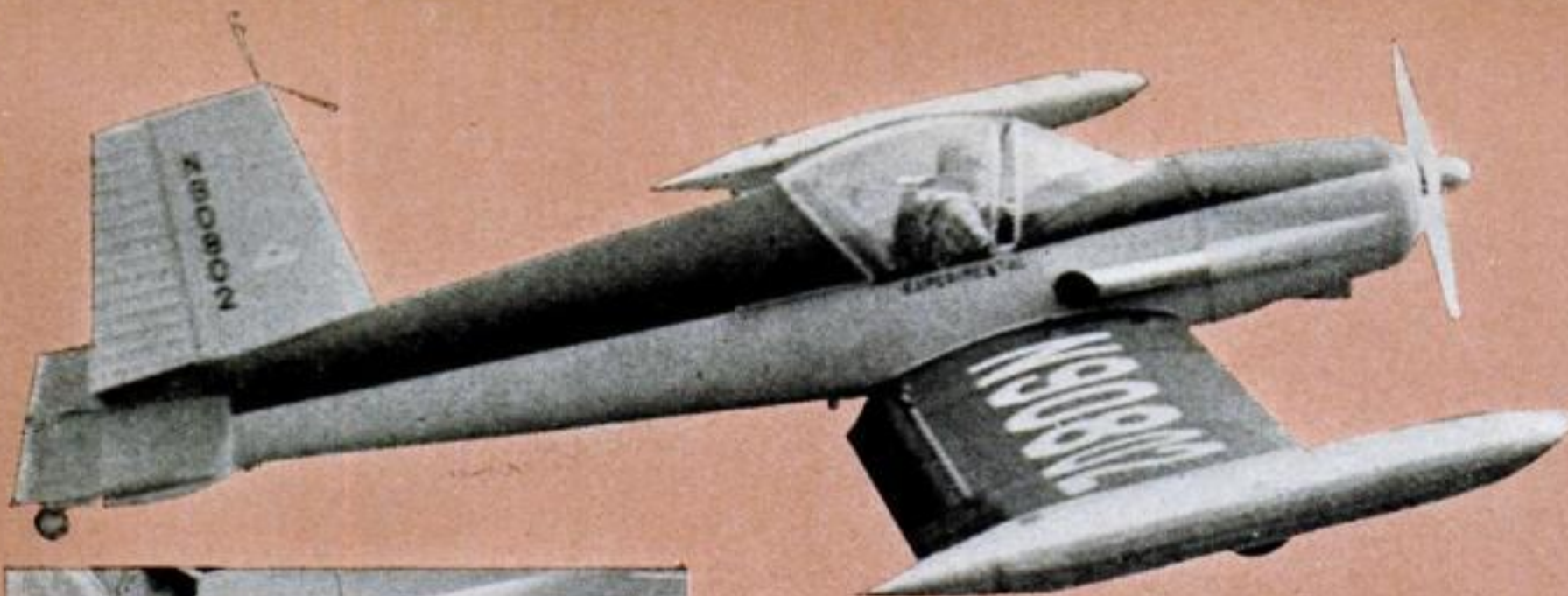
In the granite and fir fastnesses of Tweedsmuir Park, a reserve more extensive than Yellowstone, the vast hydroelectric project has begun. Already the Morrison-Knudsen Construction Co. has bulldozed

[\[Continued on page 259\]](#)



Great new pulp mill, symbolizing British Columbia's treasure chest of natural resources, will yield raw material for 200,000,000 pounds of yarn and fiber yearly—equivalent to 15 percent

of wood pulp used by entire rayon industry in U. S. In foreground of picture, log rafts may be seen beyond curving dock where U. S. Army once loaded blockbusters for South Pacific.



Machine-gun ammunition for flivver fighter is loaded through door in top of wing. Defender has range of 560 miles with auxiliary fuel tanks on tips of wings.

Flivver Plane Totes Guns, Bombs

A PLANE no bigger—and no faster—than the flivvers seen by the thousands on the nation's civilian airports is being considered by the Army as a support weapon for ground troops. Known as the Defender, it weighs only 1,160 pounds empty and cruises at 144 miles an hour—less than a fourth the speed of today's jet fighters.

If accepted as part of a put-put air force, it would oppose the trend toward bigger

Army's New Vehicle Can Be Bus, Ambulance, Truck—or All Three

Now the Army has come up with a changeable chariot that does triple duty as a bus, truck, ambulance or all three at one time.

The new military transportation unit demonstrated its all-around usefulness in a recent tryout before Pentagon officials in Washington.

In the interior view at the left below, it

is doubling as a bus and motorized litter carrier.

In the right-hand photo a soldier in a wheel chair is being put aboard on a plank runway.

The vehicle can carry 37 passengers or 18 litter patients or five tons of cargo—easily loaded through the wide rear doors—or any combination of these loads.





Weapons it can carry are lined up near experimental fighter at Quantico Marine Base.

and faster military aircraft. The Defender can carry napalm, bombs, rockets and guns to attack enemy troops. Built by the Fletcher Aviation Corp., Pasadena, Calif., it

carries a 1,340-pound load, including pilot and 1,000 rounds of ammunition in the wings for two .30-caliber machine guns.

Radioactivity Improves Crops

THE big "wheel" below is part of an experiment to produce better crops by exposing different plant growths to radioactivity at Brookhaven National Laboratory in Upton, N. Y. The radiation alters cell structures and produces other changes for cross-breeding much faster than nature normally would do it. The pipe contains radioactive cobalt.



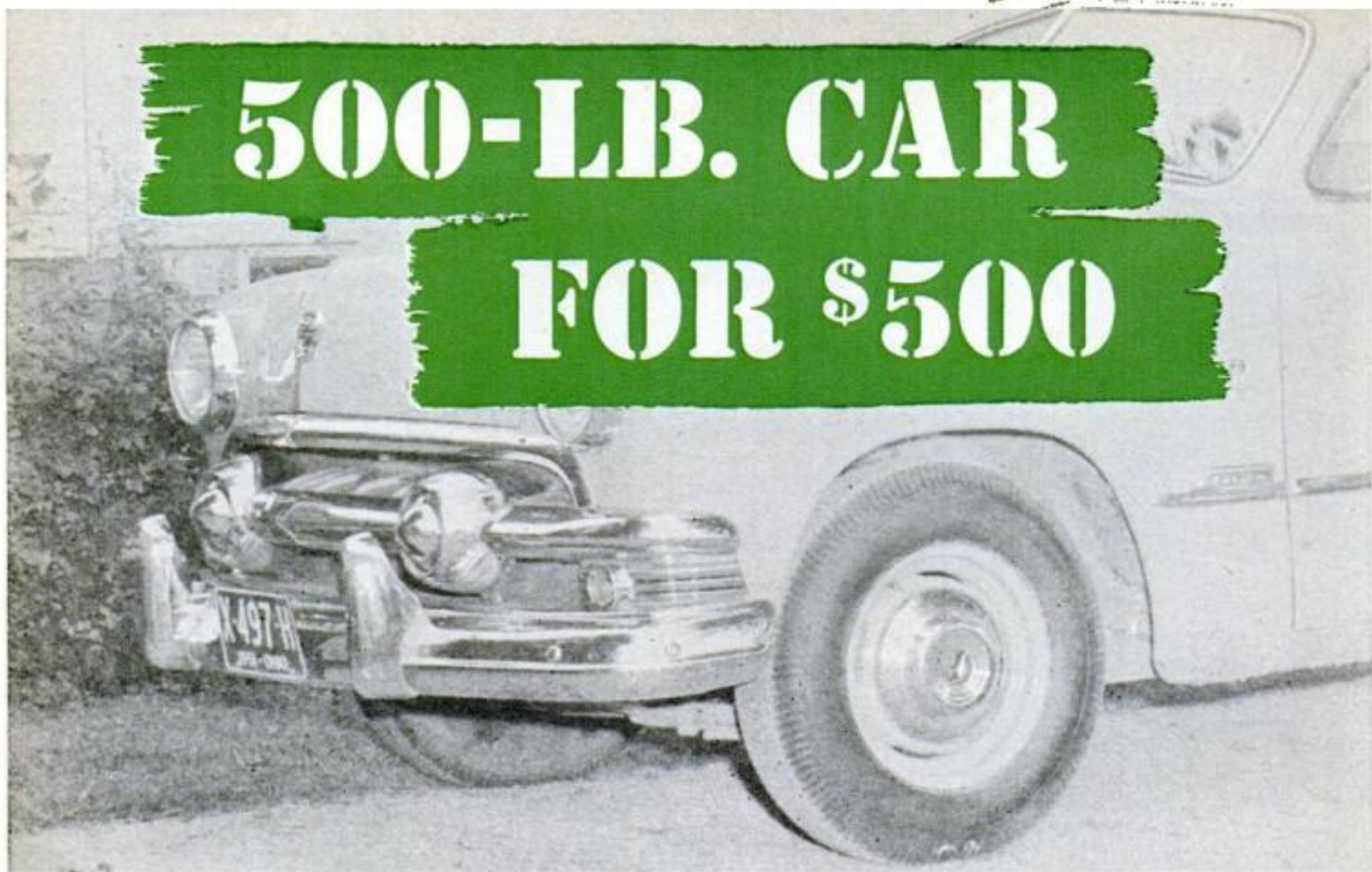
Navy Jet Carries Cameras

HERE is the Navy's new F2H-2P Banshee—first jet photographic plane developed for carrier use. The extended nose on the model below houses six types of cameras, which can be interchanged for various photographic missions. Now in production at the McDonnell Aircraft Corp., the plane is a modification of the Navy's 600-m.p.h. twin-jet Banshee fighter.



500-LB. CAR

FOR \$500



There's room in one driveway for a standard car and this two-seater, too. With a 72-inch

This one-cylinder midget, designed by former airmen, has a two-speed automatic drive. It can be bought unassembled, or in a crate ready to run.

By Harry Walton

IN a small Ohio town a couple of ex-fliers are turning out a two-passenger car you can buy for about \$400, before taxes and trimmings. Things like fenders, windshield, top and bumpers are considered extras, but even they leave the price tag on speaking terms with \$500.

The car is really practical. It will run a dozen errands and still give you change out of a buck at the gas pump. As I found by driving it, it will climb steep grades, make better than 40 on the highway, squeeze into a substandard parking space, and ride out real bumps. It will seat two husky passengers and take a couple of armloads of packages as well.

Anybody can drive it. If you have an able-bodied maiden aunt who never got the hang of the old electrics, you can teach her to drive the King Midget in five minutes.

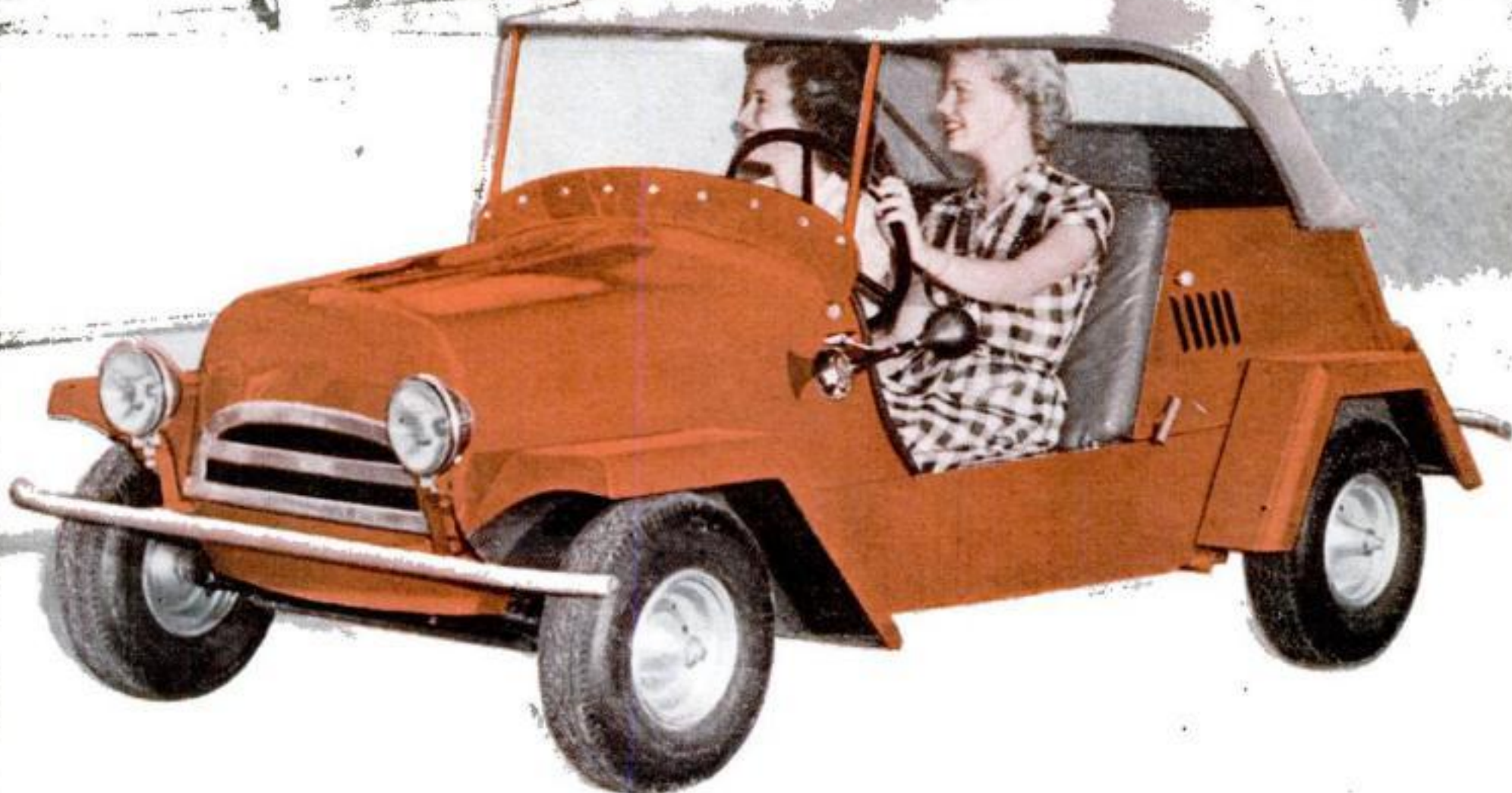
There's no clutch pedal, no gearshift lever, no Greek-lettered selector quadrant. You drive with one foot—which controls an honest-to-goodness two-speed transmission.

All you do to start up is step on the gas. After a short run in low, you let up for a moment, press down again, and pick up in high—just as in the latest automatic jobs. Downgrade, the engine gives compression braking down to about 15 m.p.h.

Climbing hills, the engine stays in high until it drops considerably below the cut-in speed. Then it shifts to low and keeps right on. You can't forget to shift, and you can't stall the engine.

Who makes it? The King Midget got off to an imperceptible start when two pilots met in the Civil Air Patrol. Both were machinists by trade; both had built their own planes, as well as cars and motor scooters. And both wanted to manufacture something with an engine in it.

Chunky, blue-eyed Dale Orcutt dreamed of turning out planes at first, for both pilots had ideas about aircraft design. But Claud Dry, once an aerial photographer and operator of a small airport, was less optimistic



wheelbase and a 42-inch tread, it fits into a space only 48 inches wide and 8½ feet long.

about private flying. Inevitably the talk got around to midget cars.

The partners decided to keep their feet on the ground. In 1945 they bought out a defunct motor-scooter factory, named their new firm Midget Motors Supply, and established their plant in Athens, Ohio.

By 1946 they had designed a single-passenger midget racing car and bought out two more scooter plants. A powerful scooter of their own design was a success and is still in production. But their dream was to build a small two-passenger car.

The difficulties loomed large. A differential would boost costs formidably; would one-wheel drive do? Could a really light car be roadworthy? Could a mechanical starter be devised, saving the price of a complete electric system? Nine test cars were built—at the price, they ruefully assert, of 12 Cadillacs. One was hastily junked; others revealed basic design headaches.

It's no scale model. They found the answers in their knowledge of small-plane construction, and in their own ingenuity. If you just scaled down a big car, they reasoned, you'd wind up with a small one

that was almost as complicated and costly.

The new car had to be planned from a fresh start. One-wheel drive was found to be effective if car weight was properly distributed and springing right. The engine went in back, on the drive-wheel side. Rope and pedal starting were discarded in favor of a retractable cable. This runs over pulleys, giving a two-to-one advantage, to a rack that meshes with a pinion on the engine—but only when you pull the cable.

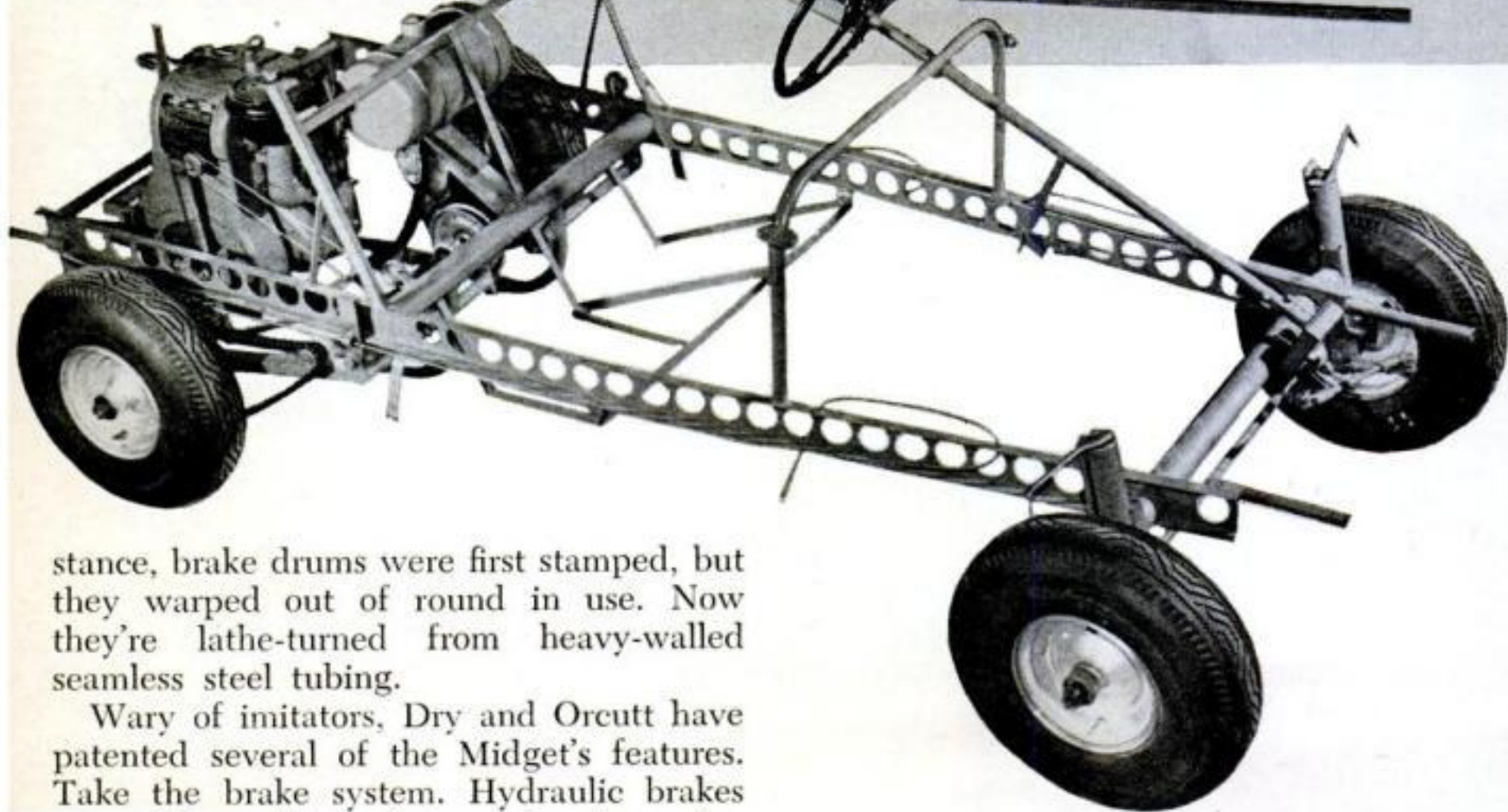
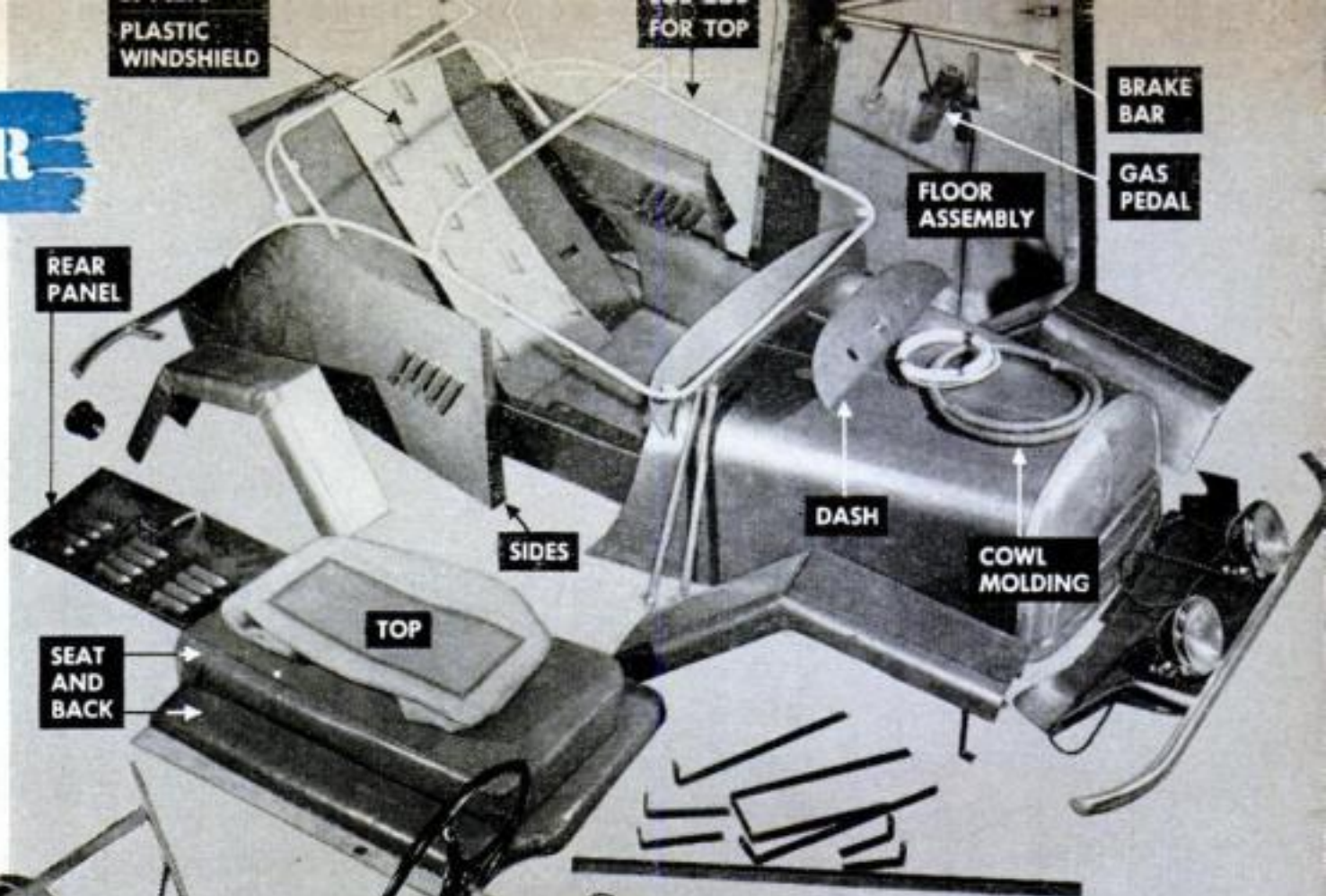
Simplicity, patented. The King Midget is starkly simple where it doesn't hurt, but significant details aren't skimmed. For in-

Four can tote it. The car weighs less than 500 pounds, with most of this on the rear wheels. One man can slide the front end to get the midget in or out of a tight space.



500-LB. CAR

You can buy it knocked down. Metal parts of the body (right) are steel. Fenders, bumpers, cloth top and plastic windshield are extra. Basic unit is the welded frame, of seamless steel tubing and airplane-type channel, shown below with wheels and engine. Buyer needs only common tools.



stance, brake drums were first stamped, but they warped out of round in use. Now they're lathe-turned from heavy-walled seamless steel tubing.

Wary of imitators, Dry and Orcutt have patented several of the Midget's features. Take the brake system. Hydraulic brakes are self-equalizing but costly to make. Mechanical brakes are troublesome to equalize, hard to keep that way. Wanted: self-equalizing mechanical brakes.

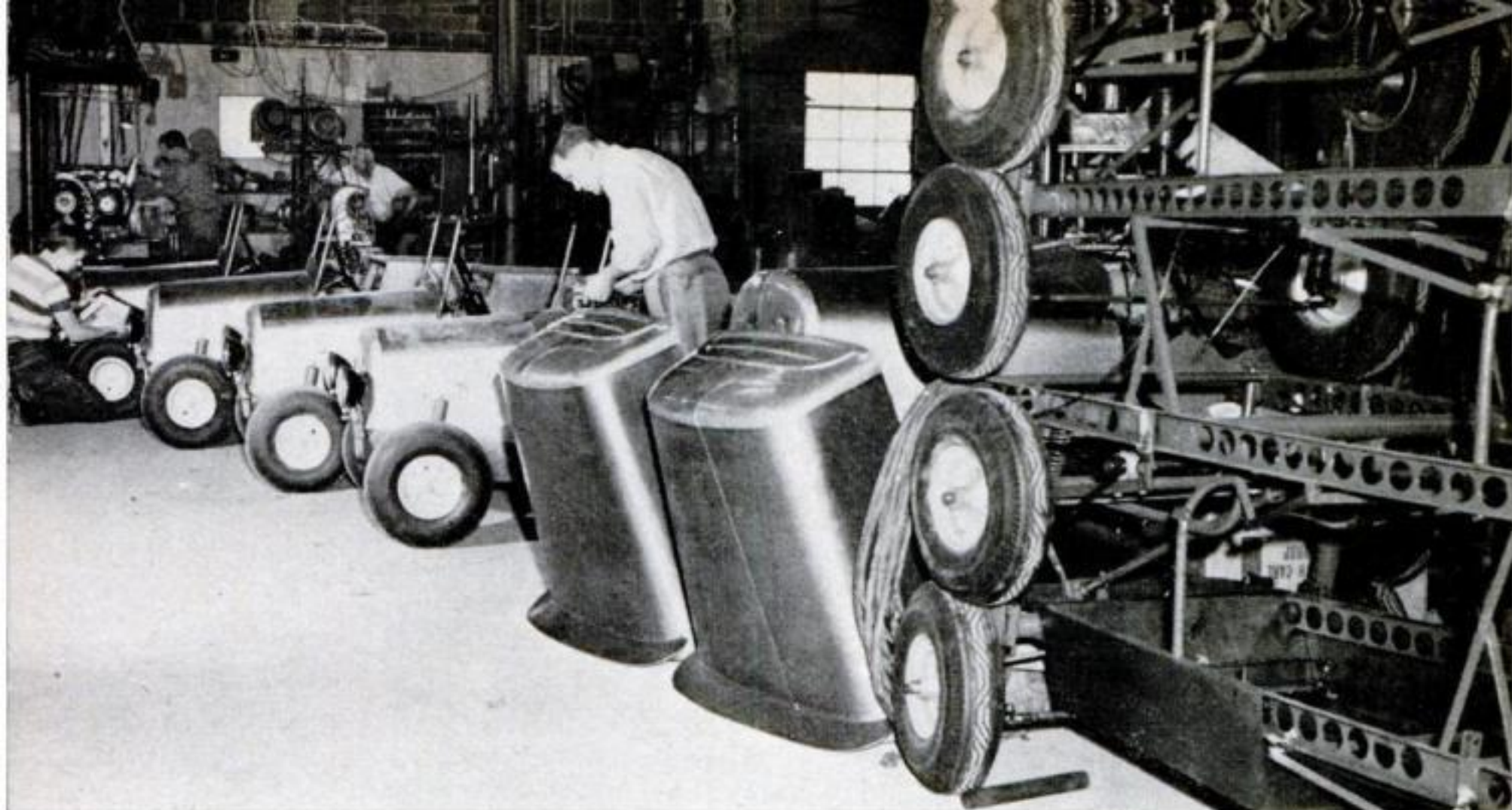
The King Midget has internal-expanding brakes actuated by cables. But the gimmick is in the cable rigging. It runs from one brake to a pulley near the driver's feet, across the car, around another pulley, and back to the other brake. These pulleys are mounted on the ends of a pivoted bar to which the pedal is welded. The bar multiplies pedal leverage, while the cable, free to move over the two pulleys, equalizes itself at all times.

The hand brake is a simple lever working on the toggle principle. When thrown so that the cable pull is just past dead center, it holds positively—without tooth or ratchet.

Power plant. Inside this little bus is a one-cylinder, 23-cubic-inch Wisconsin engine. But there's no one-lung jerkiness to the car. Pickup is smooth, and the shift to high quick and easy. The four-cycle engine is rated $7\frac{1}{2}$ horsepower at the comparatively low speed of 3,000 revolutions per minute. It is air-cooled by a built-in blower (there's no radiator).

This engine boasts such features as roller crankshaft bearings and an oil-bath air cleaner. There are also a two-jet carburetor, automatic spark advance and impulsed-coupled magneto ignition. This last means you don't have to spin the engine like a whirling dervish to get a hot starting spark.

Standard starting equipment is the Yankee type—you yank a retractable cable on the



Or they'll put it together for you, and paint it a standard cream finish. All parts except engine

and wheels are made in Athens, Ohio, factory. Above is one of the assembly lines.

side of the car. Since you can't stall the engine, one start lasts a whole trip. You can get a battery-powered starter as an extra.

The engine holds three pints of oil, circulated by a pump. You switch from grade 30 in summer to 20 in winter. That's all the winter conditioning you do.

It shifts for itself. The car can be bought with a single-ratio automatic drive. This is a centrifugal clutch of special design that lets the engine outrun the drive for a quick getaway and pickup, and locks it

in after the gas pedal is momentarily let up.

The two-speed transmission, listed as an extra, gives better pickup and hill-climbing ability, for it affords two distinct drive ratios. The car PS tried out had this transmission.

This patented drive gets results with a minimum of parts, complication and cost. It consists of dual V-belt drives, with pulleys of different ratios, and two automatic clutches. These operate somewhat like self-energizing brakes, engaging at a much higher speed than they will disengage at. The

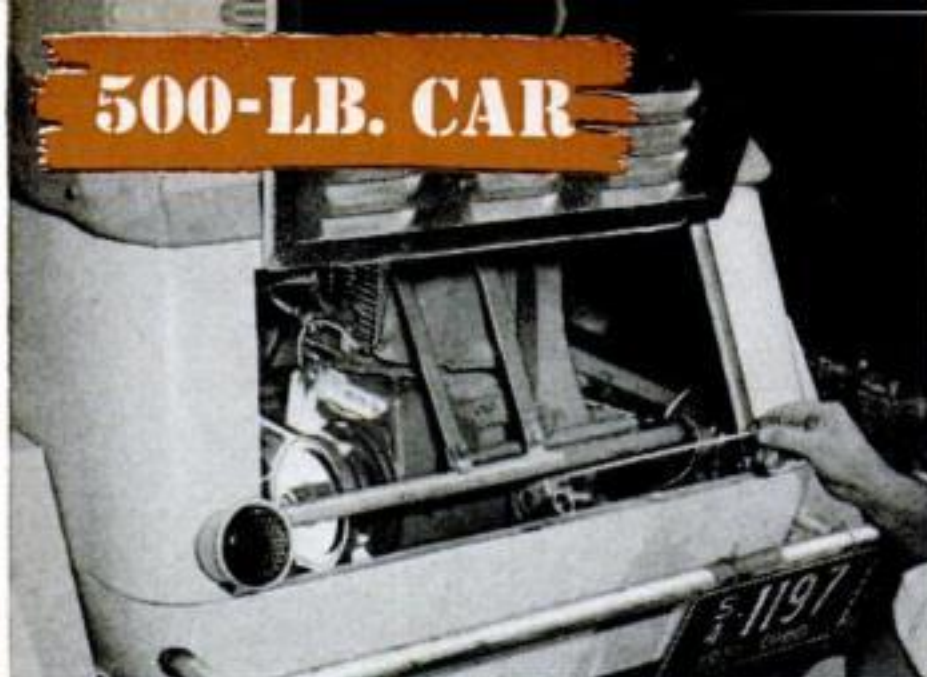


Leg room is good, and you don't sit way down—seat is 9½ inches above floor. Although seat cannot be moved forward or back, brake and gas-pedal mounting can be adjusted to suit.

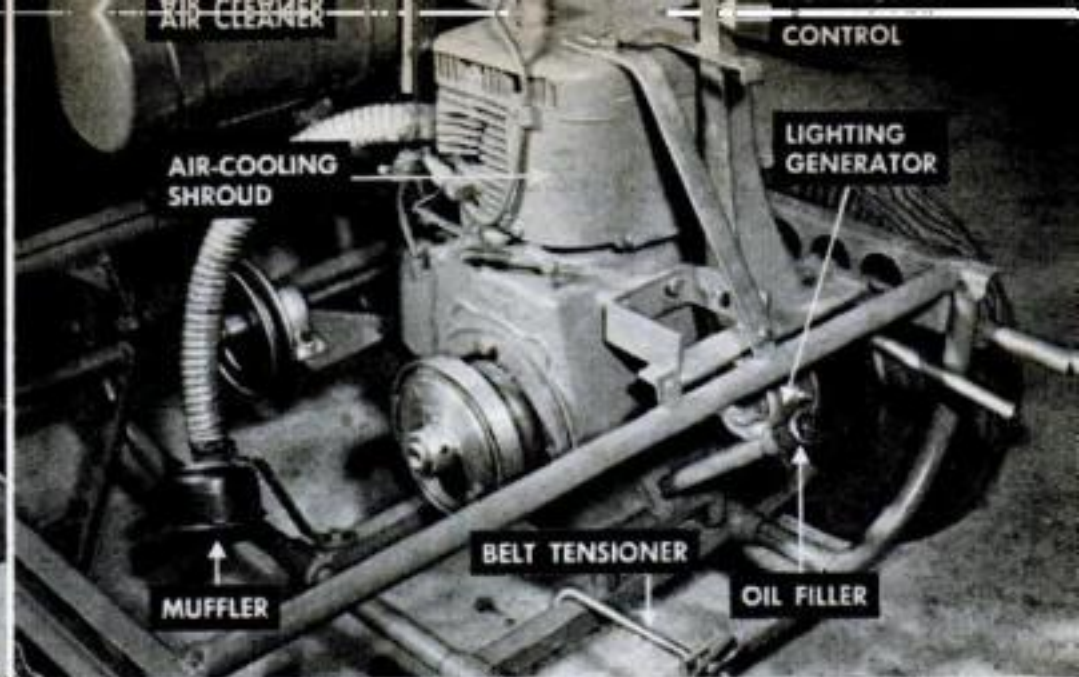


Starter cable has handle on driver's side of the body. Small button above louvers is the choke. Cable retracts into body. Once the engine is running, you can't stall it.

500-LB. CAR



Oil is checked on a dipstick. Engine holds three pints. Being air-cooled, it requires no antifreeze in winter, only lighter oil. Spare tire goes on outside of rear panel.



One-cylinder power plant slides on its mounts for tensioning drive belt (not shown). Pulleys seen are for the single-ratio drive. Lighting generator runs only when lights are wanted.

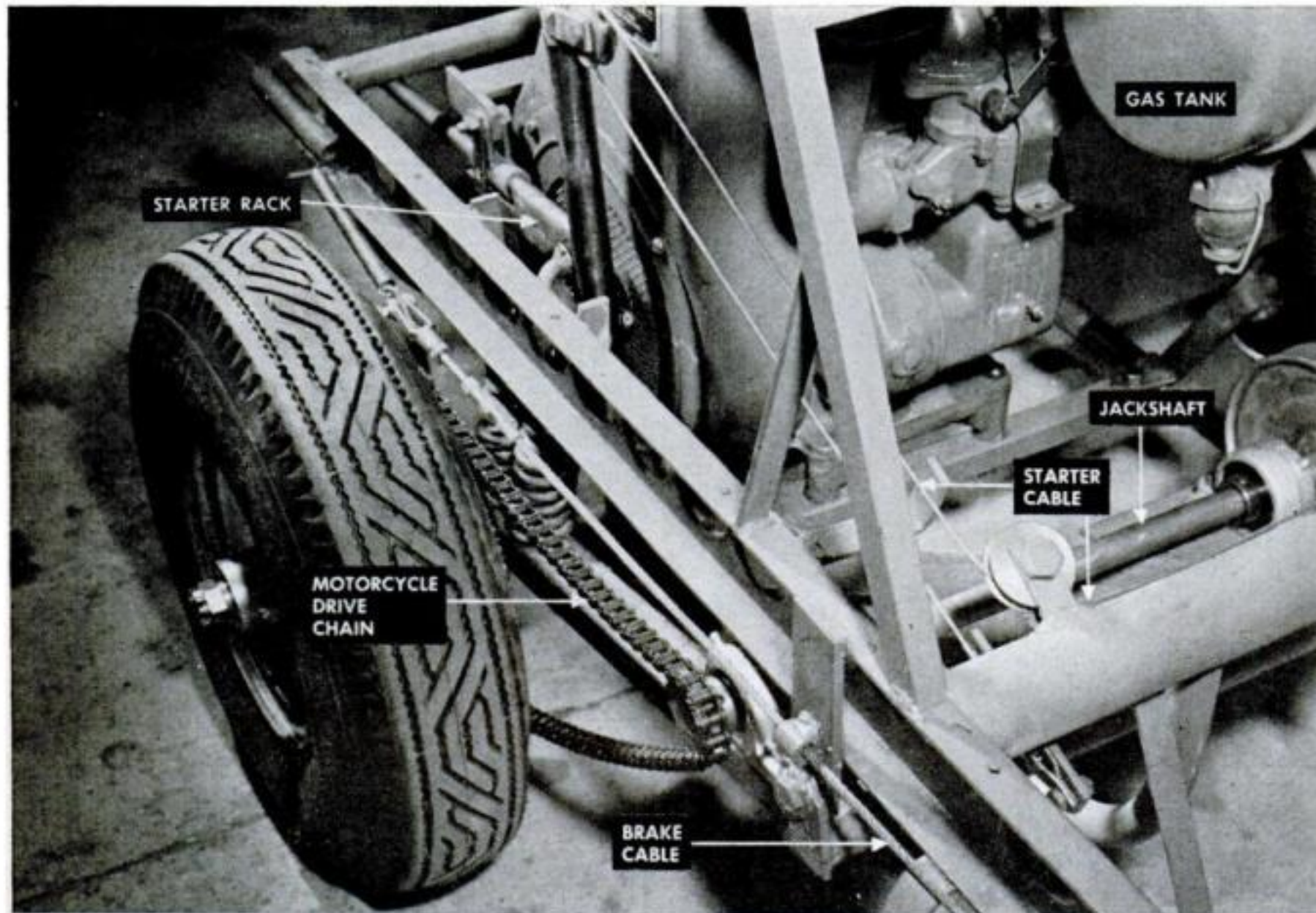
low-speed clutch gets the car off to a smooth start. Then, at about 14 miles an hour, the high-speed clutch locks in, the low-speed drive free-wheels through an overrunning device, and you're rolling in high.

On a hill, you stay in high until speed drops to about seven miles an hour. Then there's a quick automatic shift to low, during which the engine picks up speed. You go right up.

The centrifugal elements that take up the load are faced with molded lining and give

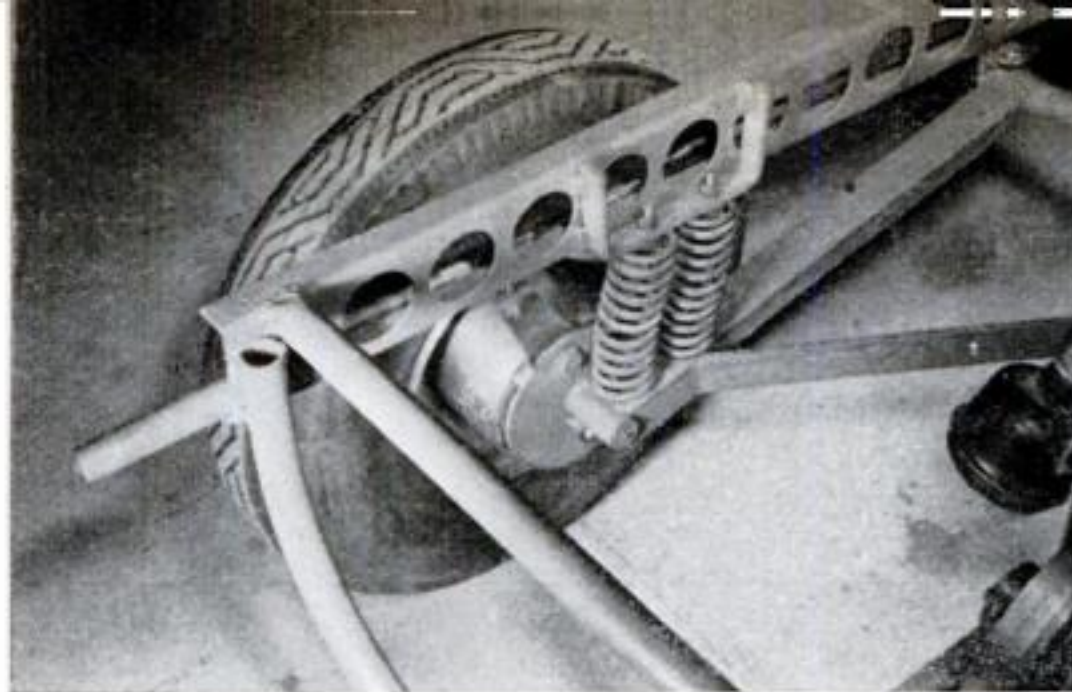
a positive lock when they are engaged. Both V belts are the heavy industrial type, with steel cables inside.

The jackshaft drives a gearbox by which the car can be reversed. From there a motorcycle chain drives the right rear wheel. To back up the car, you flip over a short lever under the front of the seat. That's the only time you touch anything resembling a gearshift, and the only thing Aunt Matilda could stub a thumb on. The lever has a neutral position, so the car can be towed



Chain from jackshaft drives rear wheel. Starter meshes rack with engine pinion only when

cable is pulled. Wheels run on tapered roller bearings. Tires are 5.50 by 8, 18 inches outside.



Wheels are sprung independently. Each rear one is mounted on a triangular frame pivoted at its wide end (upper right in photo). Front wheels have enclosed springs, oil shocks.



Four-wheel springing can take it, as I discovered by repeatedly running up curb at drive-ways and then hopping off (above). The bump was easy, and there was no loss of control.

easily, without turning the engine over.

How's the ride? Not sedan-soft, but by no means uncomfortable. All four wheels are independently sprung—the rear ones on coil springs, not snubbed, and the front ones on oil-filled combination shocks and springs, heavily snubbed. You can bounce the back of the car, but not the front. Despite the absence of rear shock absorbers, the drive wheel will always stay flat-footed on the ground.

Steering is through a gear and segment, with a much lower ratio than the one in your Breezeway Eight. The Midget responds like a sports car on the turns; a twitch and you're around the corner. But that snubbed front end makes it foot around the curves nicely; there's no sway or wandering. With its low center of gravity, it would be hard to turn over.

The chassis is of welded-steel tube and channel. Body parts are cold-rolled steel. Like a plane, the car has a plastic wind-

shield—it costs less than safety glass, is light and nonshatterable, but can be scratched.

How about bad weather? Side curtains and heater are extras. The curtains are fitted on a steel frame, hinged like a door. The canvas top stretches over a strong steel-tubing frame, well supported by the windshield posts and by braces at the rear. But you can't take the top down on the road, for there is no way to stow the frame. "Next year, maybe we can make it fold," say the designers hopefully.

What about servicing? King Midget dealers are scarce, but the little car has fewer potential trouble spots than any other. The drive chain, subject to grit and wet, may need occasional adjustment or replacement. Drive-belt tension is a simple matter of tightening a draw bolt on the engine. Brake adjustments are easy and obvious.

Owners who know which end of a wrench fits the bolt will probably enjoy working on

[Continued on page 266]



Top speed won't get you a ticket on this highway. Officer Joe McBride of Athens police clocked a new King Midget for PS at 42 m.p.h. The car will beat that when broken in.



From dead stop, car started up 37-percent grade (tough even to *walk* on), though drive wheel spun on smooth brick. On ordinary "steep" 17-percent hill, wheel didn't slip.



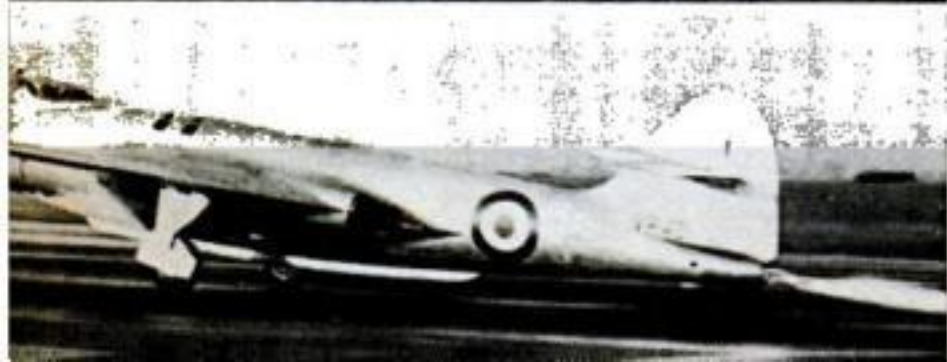
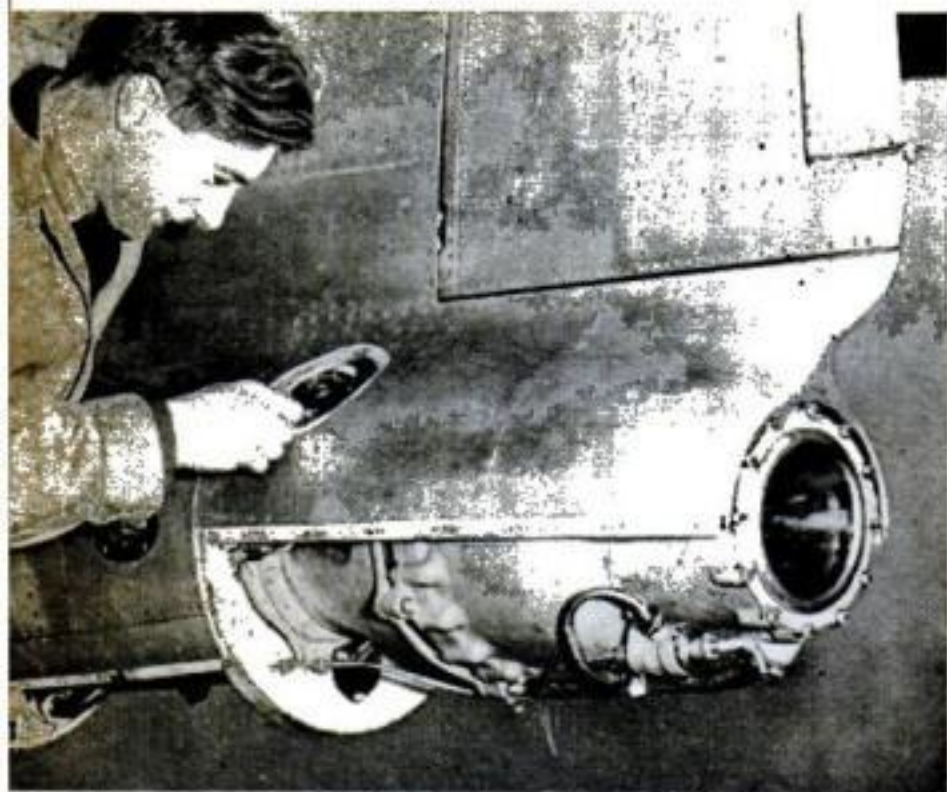
Four-Engine Bomber. Here is the first flight picture of the RAF's new long-range bomber, the Vickers Valiant. The swept-wing plane first appeared publicly in the recent annual British aircraft show at Farnborough. There spectators saw it zip across the sky at more than 600 m.p.h., claimed

to be a record for its size. Other performance figures are still secret. Four Rolls-Royce Avon engines are housed completely within the sleek ship, each pair sharing an air intake in the wing. Dubbed unofficially an atom-bomb carrier, the Valiant has been ordered in quantity.

Britain Shows 'Fastest Jets'

Built-In Booster. The "Snarler," an auxiliary rocket engine unveiled at Farnborough, gets its name from its noise. Shown built into the tail of an experimental jet, the 215-lb. motor provides an extra 2,000 lb. of thrust for take-off (lower photo), climbing or a sudden burst of speed.

Top-Speed Fighter. The Hawker P-1067 (below) is described by the British Air Ministry as the "world's fastest" fighter—faster than Russia's MiG-15 or the U.S. F-86 Sabre. Observers who got a glimpse of it at the air show estimated its speed as at least 700 m.p.h. All details are secret.



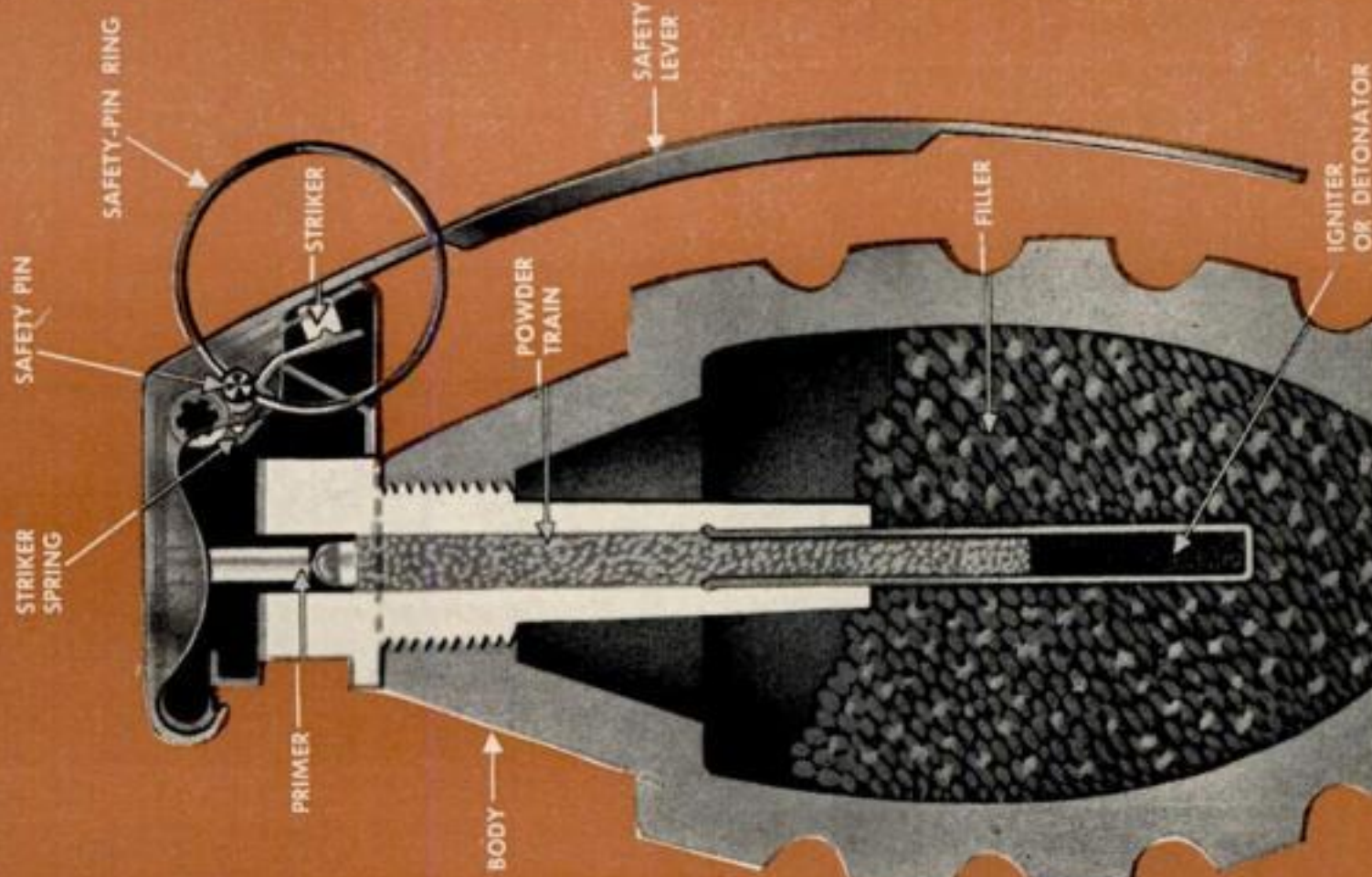


How the Hand Grenade Works

The hand grenade is the infantryman's personal artillery, for use against machine-gun nests and other dug-in targets. The most common type is the fragmentation grenade. When it explodes, its notched body splits into dozens of deadly chunks of flying metal. Other types are non-fragmentation, smoke, tear-gas and incendiary grenades.

To throw one, you hold handle against grenade's body, pull pin and hurl it overhand. Powder train reaches detonator in about five seconds and then... *duck!*

THESE ARE THE PARTS...



THIS IS WHAT HAPPENS AFTER SAFETY PIN IS PULLED...

- 1 With safety pin out of the fuse body, only hand pressure on safety lever keeps fuse from starting to work.
- 2 When safety lever is released, striker spring swings striker around to hit primer, causing it to burn.
- 3 Primer sets off time fuse that carries fire to detonator.
- 4 Detonator bursts, causing grenade to explode into death-dealing fragments.

Know Your Weapons



Huge Silencers Cut Roar of Jet Engines

WORKMEN no longer have to shout to be heard above the roar of jet engines at the North American Aviation manufacturing plant in Los Angeles. They have tied cans—silencers—to the engine exhausts.

The drawing at the right shows how it's done. Two silencers are pictured. The one in the foreground enfolds the tail of a fighter plane. Air is circulated through this Quonset hut to cool and equalize the pressures on the tail pipe. The silencer proper sticks out from the rear of the hut.

The other building, in the background, is for testing jet engines alone. The two silencers rest alongside each other on steel pedestals.

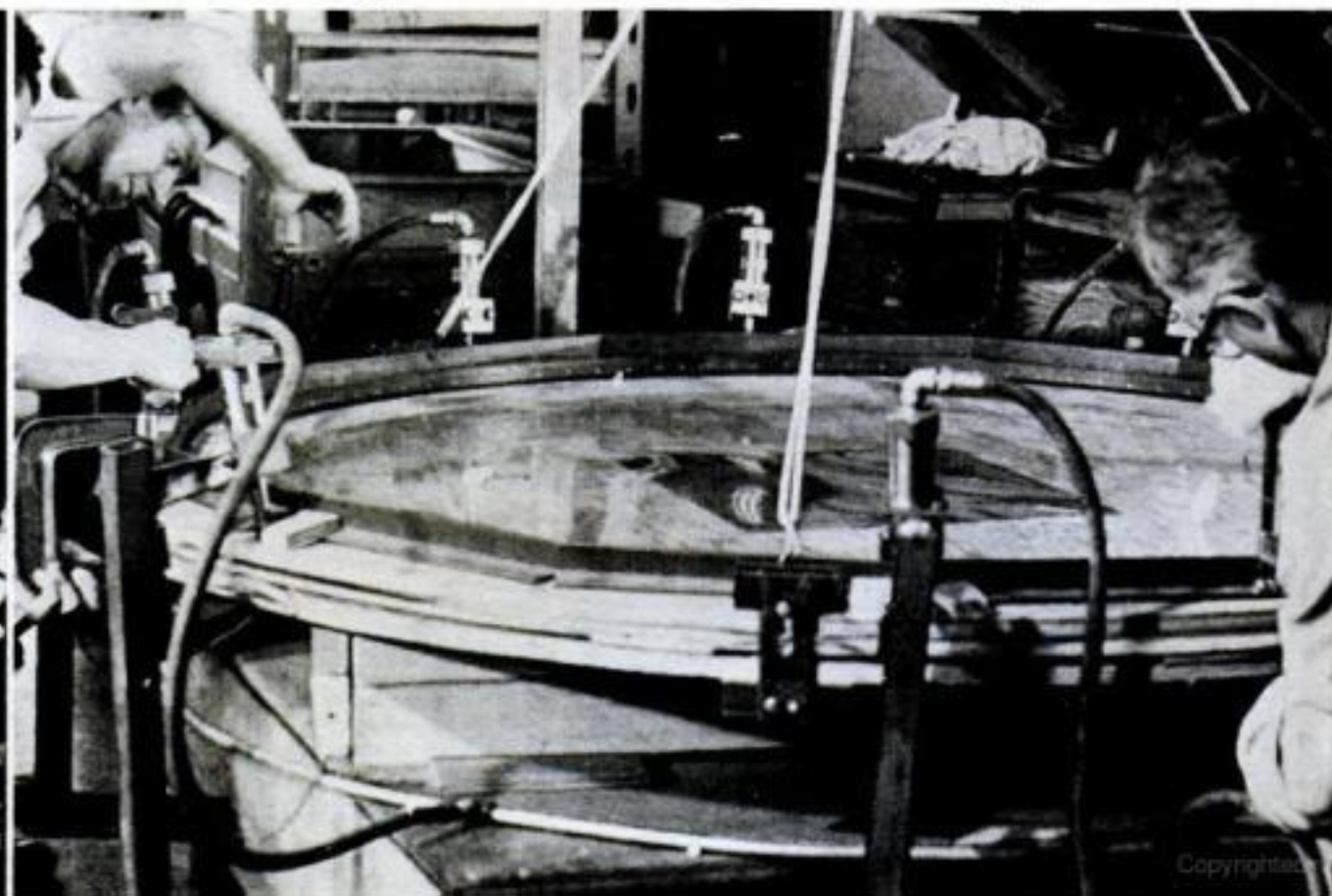
The muffling is done by routing the exhaust gases through a pipe built on the same principle as the Maxim silencer for guns. In addition, an elbow fitted with turning vanes expands the gases evenly as they reach the outside air and reduces their velocity to rob them of their whine.

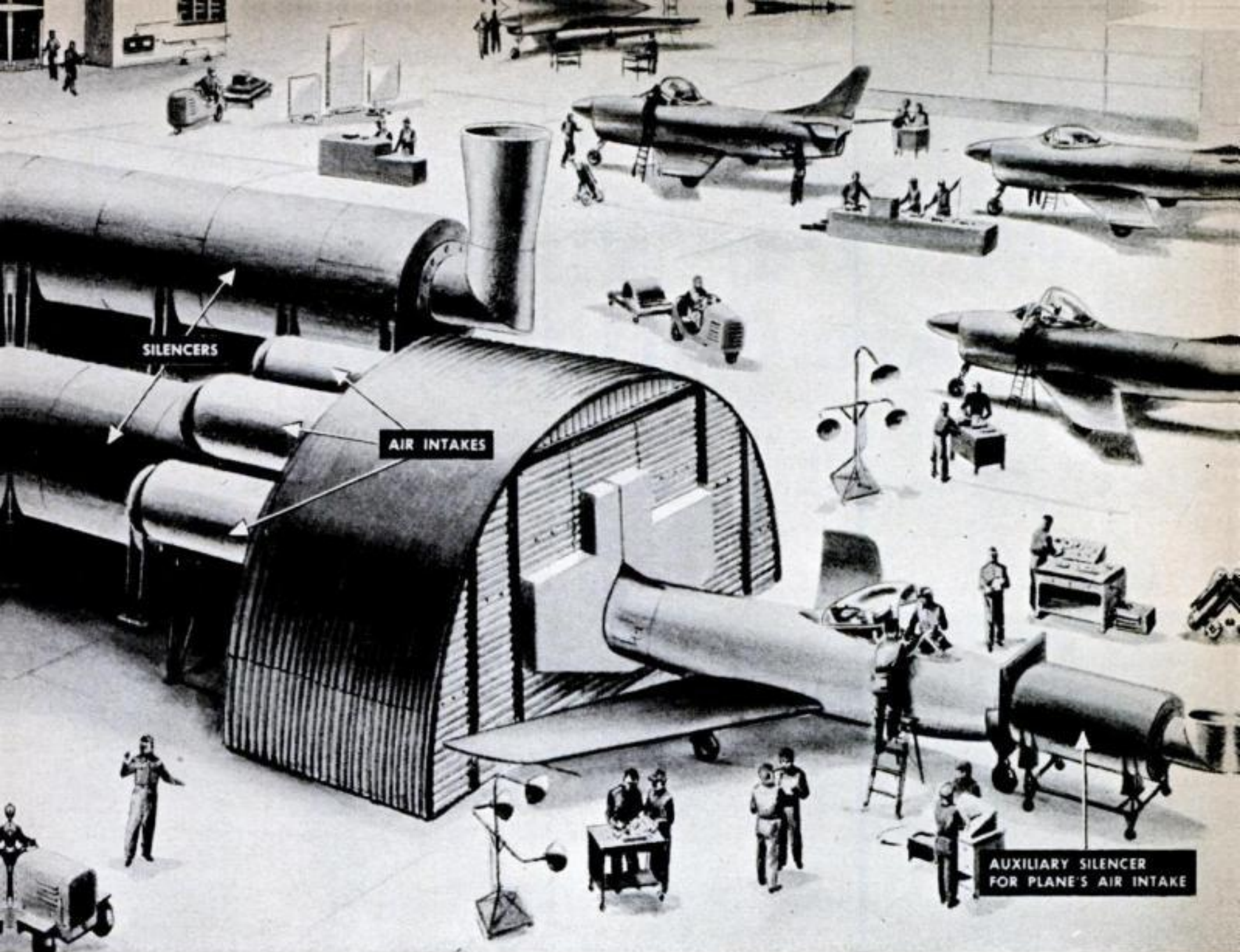


This Is How They Blow Bubbles

1 The fish-bowl canopy that encloses the pilot's cockpit of many helicopters starts out as a sheet of Plexiglas. The sheet first is cut into a disk, and then screwed to an aluminum ring, as shown below, that serves as a support during fabrication process illustrated here.

2 Heating in an oven to about 350 degrees is the next step. After the plastic disk has been softened to the flexibility of rubber, it is removed from the oven and placed in a forming jig, below. Here hydraulic clamps create an airtight seal between the rim and the jig.

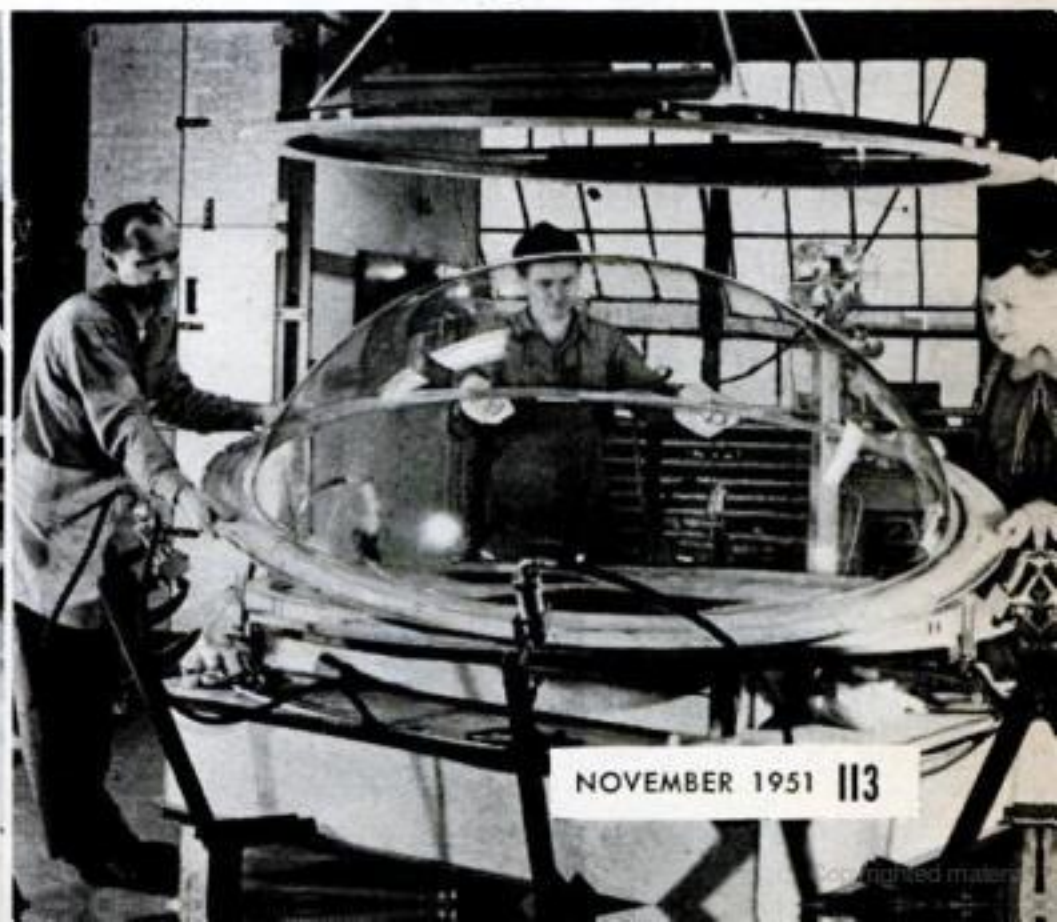
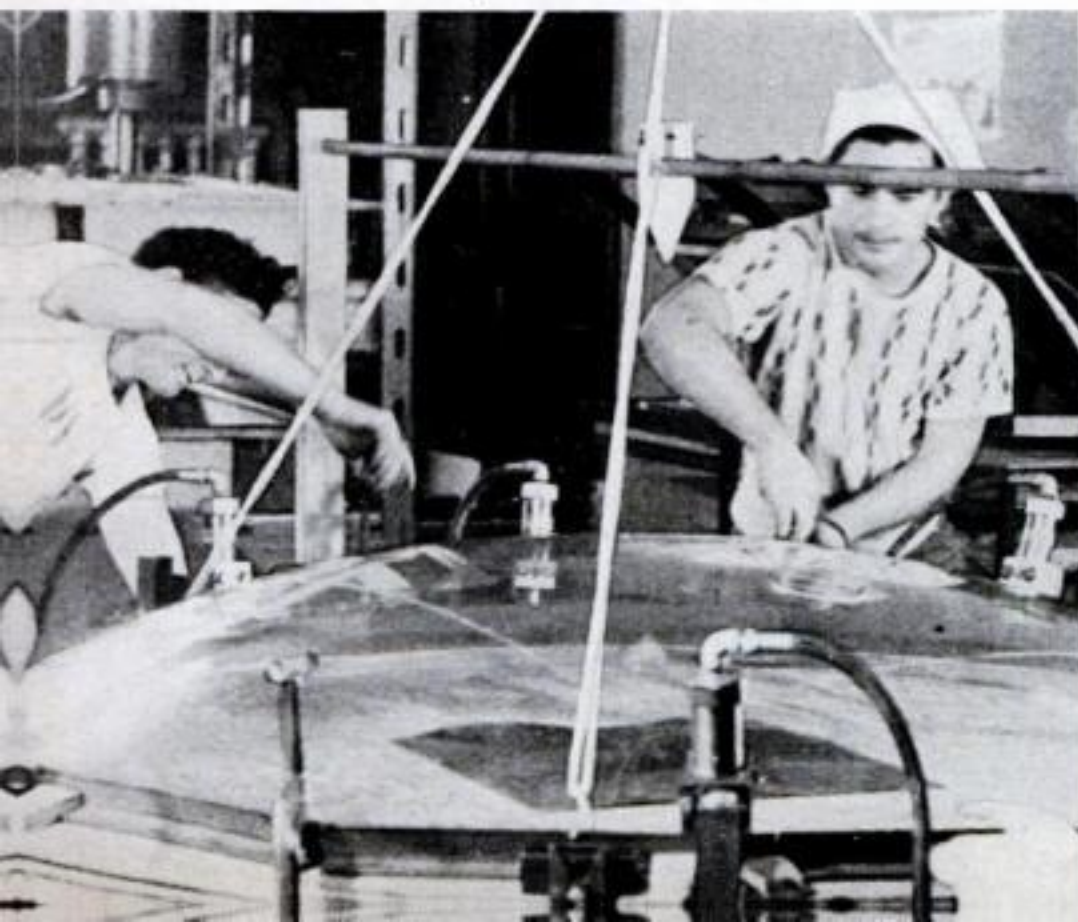




in Plastic to Make Aircraft Canopies

3 Air pressure is then applied from below. This is increased as the disk, still hot and pliable, starts to swell upward, forming a blister. Even after it has become a full half sphere, as shown at right below, pressure is maintained until the plastic has cooled.

4 After the plastic bubble has cooled and hardened, the workmen remove it from the jig in preparation for final machining operations before it is fitted to a helicopter cockpit. Photos in this sequence were taken at Acrylic Plastics, Inc., of New York City.



*The ocean comes alive in one of this year's most fascinating books. This article is condensed from *The Sea Around Us* by Rachel Carson. A lifelong student of nature, Miss Carson is editor-in-chief of the U. S. Fish and Wildlife Service.*

Why Our Winters Are Getting Warmer

The old-timers are right—winters aren't what they were. And the reason may be gigantic tides deep under the sea that apparently change the climate of the whole earth.

The Atlantic is slowly rising, and there's enough water frozen in land ice to raise it 100 feet.



By Rachel Carson

*From the book, The Sea Around Us.
Copyright 1950, 1951, by Rachel Carson.
Reprinted by permission of Oxford University Press, Inc.*

DAY by day and season by season, the ocean dominates the world's climate. Can it also be an agent in bringing about the long-period swings of climatic change that we know have occurred throughout the long history of the earth—the alternating periods of heat and cold, of drought and flood? There is a fascinating theory that it can.

This theory links events in the deep, hidden places of the ocean with the cyclic changes of climate and their effects on

human history. It was developed by the distinguished Swedish oceanographer, Otto Pettersson, whose almost century-long life closed in 1941.

To review the Pettersson theory is to review also a pageant of human history, of men and nations in the control of elemental forces whose nature they never understood and whose very existence they never recognized.

Pettersson's work was perhaps a natural outcome of the circumstances of his life. He was born—as he died 93 years later—on the shores of the Baltic, a sea of complex and wonderful hydrography. In his laboratory atop a sheer cliff overlooking the deep

If ALL that ice were to melt, which is unlikely, New York would be flooded as shown below.





Surface waves are mild compared to great submarine waves found at mouth of Baltic where

salt water meets fresh. Such tide waves are thought to explain long-range climate changes.

waters of the Gulmarfiord, instruments recorded strange phenomena in the depths of this gateway to the Baltic. As the ocean water presses in toward that inland sea it dips down and lets the fresh surface water roll out above it; and at that deep level where salt and fresh water come into contact there is a sharp layer of discontinuity, like the surface film between water and air.

Giant Waves Under the Sea

Each day Pettersson's instruments revealed a strong, pulsing movement of that deep layer—the pressing inward of great submarine waves, of moving mountains of water. The movement was strongest every twelfth hour of the day, and between the 12-hour intervals it subsided. Pettersson soon established a link between these submarine waves and the daily tides. “Moon waves,” he called them, and as he measured their height and timed their pulsing beat through the months and years, their relation to the ever-changing cycles of the tides became crystal clear.

He had found that the submarine waves varied in height and power as the tide-producing power of the moon and sun varied. From astronomical calculations he learned that the tides must have been at their greatest strength during the closing centuries of the Middle Ages—those centuries when the Baltic herring fishery was

flourishing. Then sun, moon and earth came into such a position at the time of the winter solstice that they exerted the greatest possible attracting force upon the sea. Only about every 18 centuries do the heavenly bodies assume this particular relation. But in that period of the Middle Ages, the great underwater waves pressed with unusual force into the narrow passages to the Baltic, and with the “water mountains” went the herring shoals. Later, when the tides became weaker, the herring remained outside the Baltic, in the North Sea.

Then Pettersson realized another fact of extreme significance—that those centuries of great tides had been a period of “startling and unusual occurrences” in the world of nature. Polar ice blocked much of the North Atlantic. The coasts of the North Sea and the Baltic were laid waste by violent storm floods. The winters were of “unexampled severity” and in consequence of the climatic rigors political and economic catastrophes occurred all over the populated regions of the earth. Could there be a connection between these events and those moving mountains of unseen water? Could the deep tides affect the lives of men as well as of herring?

Tides Affect Climate

Marshaling scientific, historic and literary evidence, he showed that there are alternating periods of mild and severe climates

which correspond to the long-period cycles of the oceanic tides. The world's most recent period of maximum tides, and most rigorous climate, occurred about 1433, its effect being felt, however, for several centuries before and after that year. The minimum tidal effect prevailed about A.D. 550, and it will occur again about the year 2400.

During the latest period of benevolent climate, snow and ice were little known on the coast of Europe and in the seas about Iceland and Greenland. Then the Vikings sailed freely over northern seas, monks went back and forth between Ireland and "Thyle" or Iceland, and there was easy intercourse between Great Britain and the Scandinavian countries.

Storms and Floods Wreak Havoc

But these bland climatic conditions began to deteriorate in the thirteenth century. The seacoast of Holland was devastated by storm floods. Old Icelandic records say that, in the winters of the early 1300's, packs of wolves crossed on the ice from Norway to Denmark. The entire Baltic froze over, forming a bridge of solid ice between Sweden and the Danish islands. Pedestrians and carriages crossed the frozen sea and hostelrys were put up on the ice to accommodate them. The freezing of the Baltic seems to have shifted the course of storms originating in the low-pressure belt south of Iceland. In southern Europe, as a result, there were un-



Glaciers show effect of rising temperatures: they melt back faster than they are renewed by snow, so that they are shrinking. Many smaller ones have already disappeared.

usual storms, crop failures, famine and distress. Icelandic literature abounds in tales of volcanic eruptions and other violent natural catastrophes that occurred during the fourteenth century.

All those ancient records of climatic variations seemed to Pettersson an indication that cyclic changes in the oceanic circulation of the Atlantic had occurred. Applying the discoveries in his laboratory on Gulmarfiord,



Less ice is drifting down from the frozen top of the world, opening far northern seas to fisheries and navigation—all signs of the warming up of subarctic regions.

he believed that the climatic changes were brought about as the tide-induced submarine waves disturbed the deep waters of polar seas. Although tidal movements are often weak at the surface of these seas, they set up strong pulsations at the submarine boundaries, where there is a layer of comparatively fresh, cold water lying upon a layer of salty, warmer water.

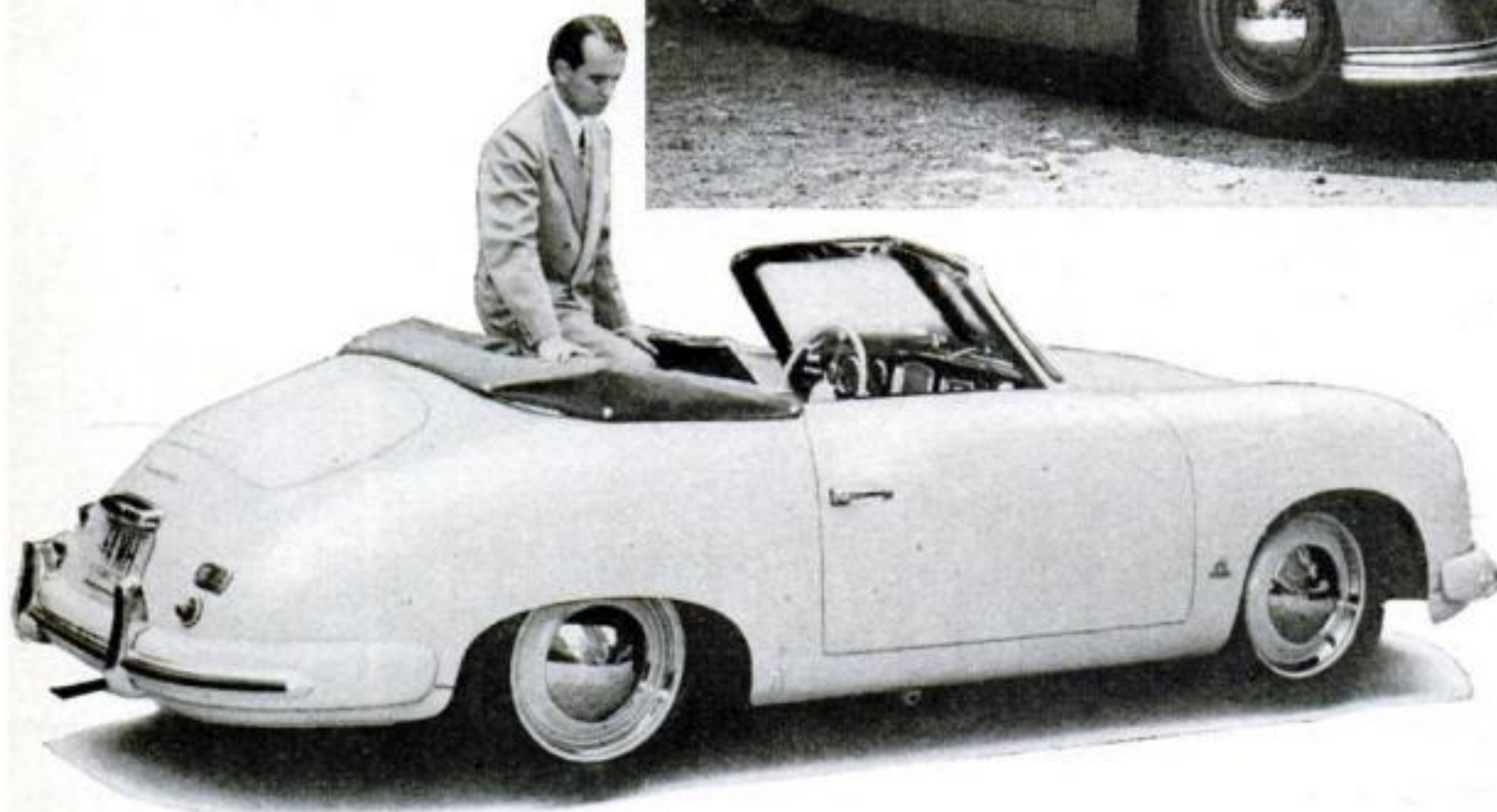
Warm Water Thaws Ice

In the years or the centuries of strong tidal forces, unusual quantities of warm Atlantic water press into the Arctic Sea at deep levels, moving in under the ice. Then thousands of square miles of ice that normally remain solidly frozen undergo partial thawing and break up. Drift ice, in extraordinary volume, enters the Labrador Current and is carried southward into the Atlantic. This changes the pattern of surface circulation, which is so intimately related to the winds, the rainfall and the air temperatures. For the drift ice then attacks the Gulf Stream south of Newfoundland and sends it on a more easterly course, deflecting the streams of warm surface water that usually bring a softening effect to the climate of Greenland, Iceland, Spitsbergen and northern Europe.

Although the really catastrophic disturbances of the polar region come only every 18 centuries, according to Pettersson, there

[Continued on page 252]

Porsche coupe at right has large luggage compartment behind front seats. This space can be converted into seats for two children or one adult. Convertible (below) has manually operated top. Seats are independently adjustable.



Germans Build Luxury Car

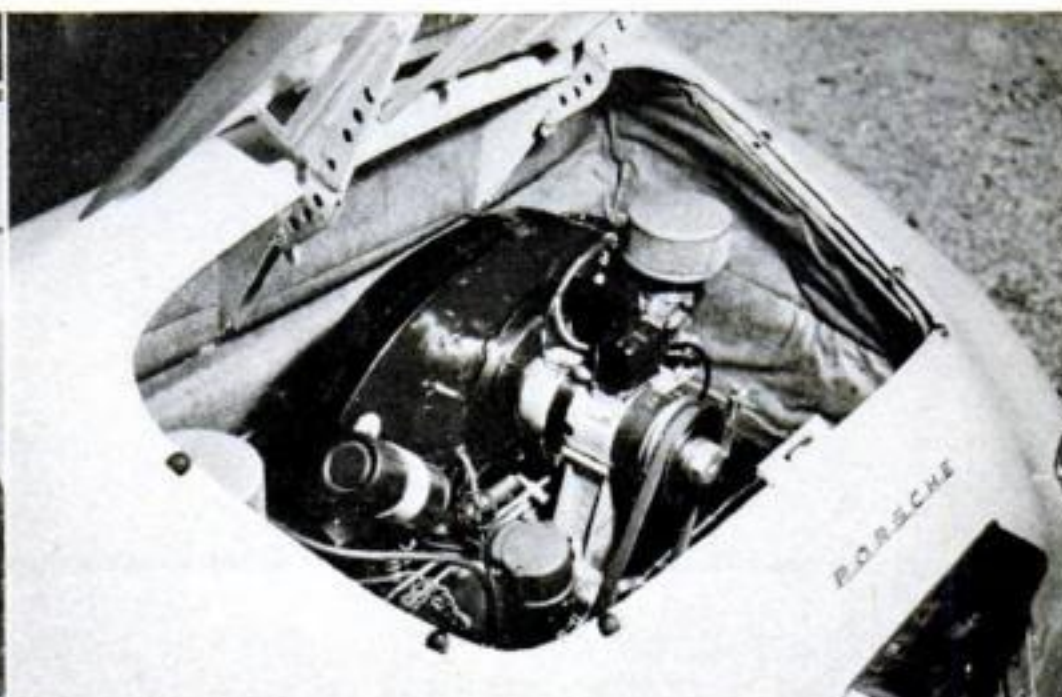
WHEN Dr. Ferdinand Porsche produced the prewar German Volkswagen (People's Car) he stressed utility and economy rather than the luxury of such cars as the Mercedes SSK which he also helped design. In his last effort (Dr. Porsche died early this year), however, he went back to his old love—and gave the result his own name. The Porsche car, now in production in West Germany, is a high-performance

automobile that sells in the U.S. for close to \$4,000. It is available in two body styles—coupe and convertible—and in three engine types—40 hp., 44 hp. and 52 hp., developing top speeds of 85, 90 and 100 m.p.h.

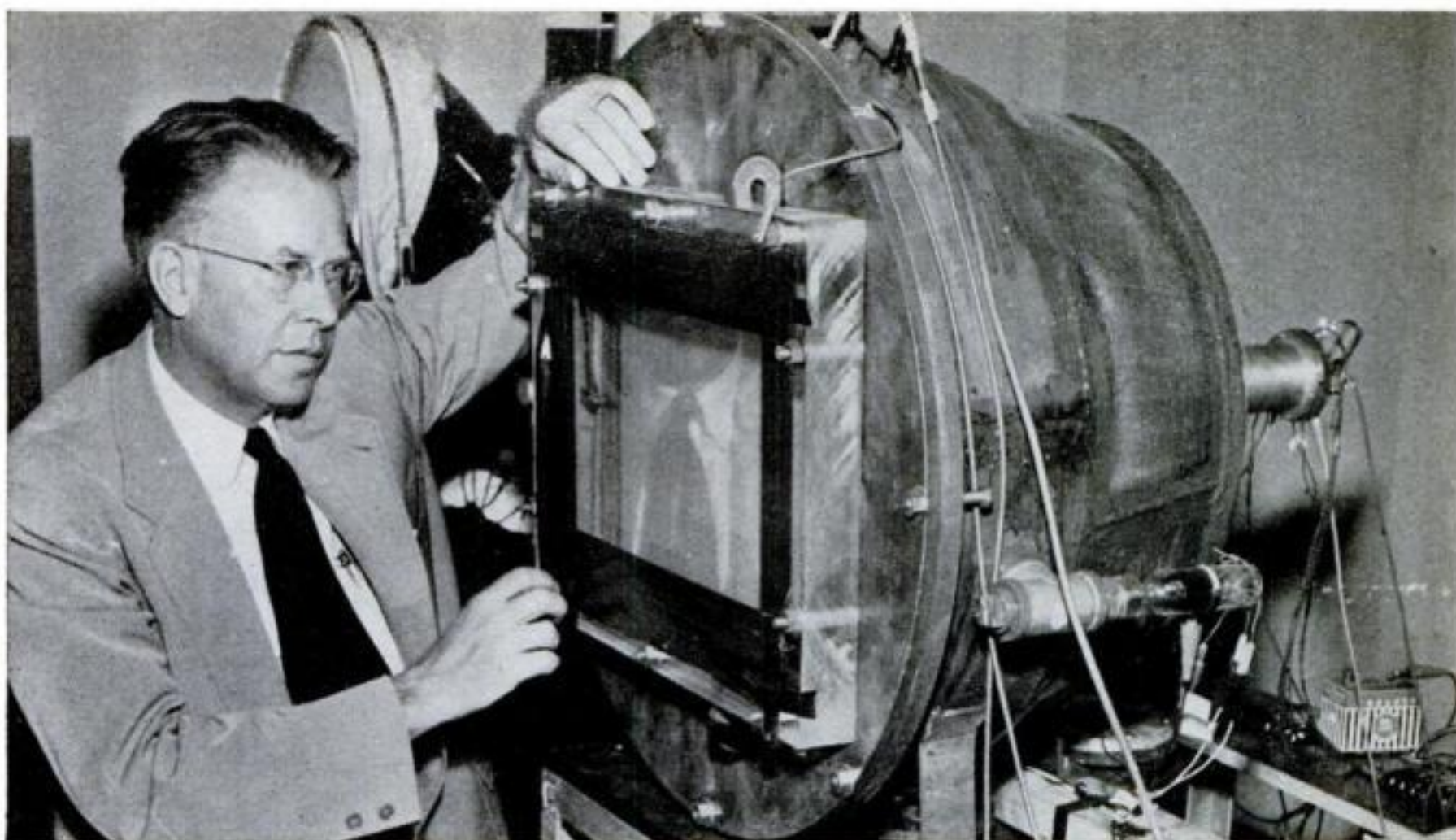
It is small and light. Over-all length is 12 feet, 8 inches; height is 4 feet, 3 inches; width is 5 feet, 6 inches; and weight is 1,640 pounds.



Spare wheel and fuel tank are located under front hood. With the car's low fuel consumption—it gets 35 miles per gallon—the 12-gallon tank gives a driving range of 420 miles.



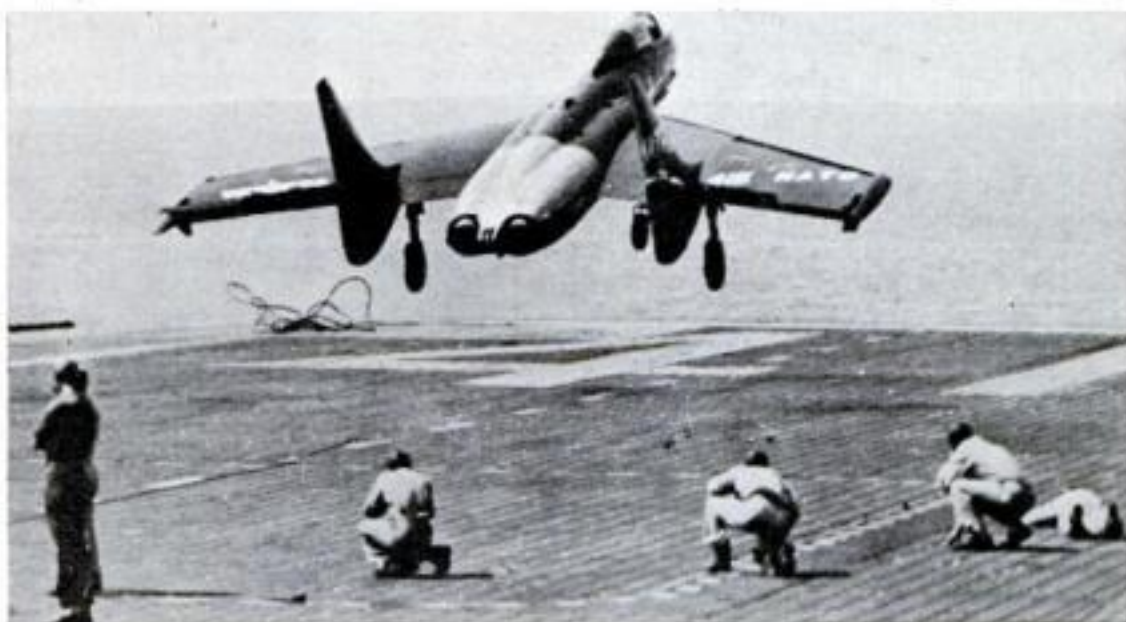
Four-cylinder opposed (pancake) engine fits neatly into rear compartment. Each engine is individually assembled by one mechanic. There are two downdraft carburetors.



Scientist Makes Color TV Tube

PROF. ERNEST O. LAWRENCE, University of California scientist who invented the atom-smashing cyclotron, exhibits above a

color-TV tube he has devised for receivers. Paramount Pictures Corp., which plans to make it, says it eliminates whirling disks, works with any known color-TV system and costs little more than a black-and-white tube.

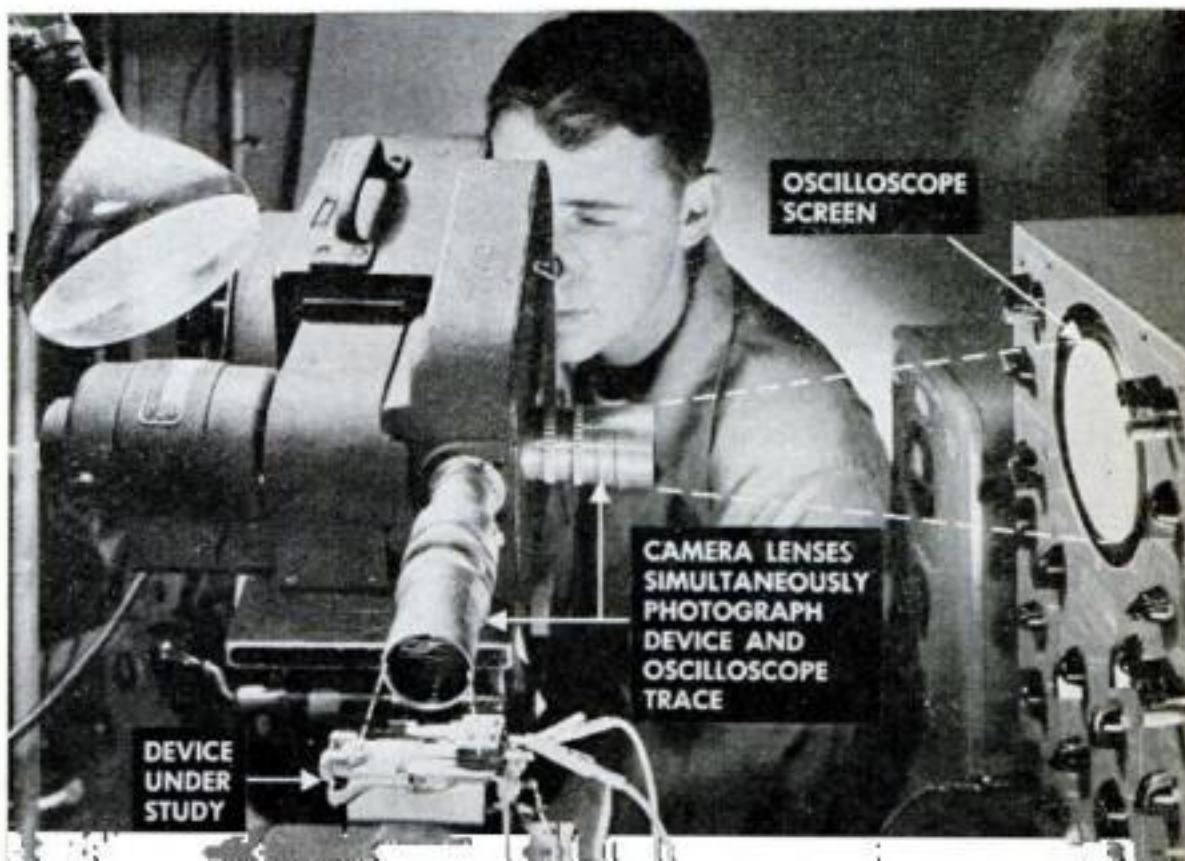


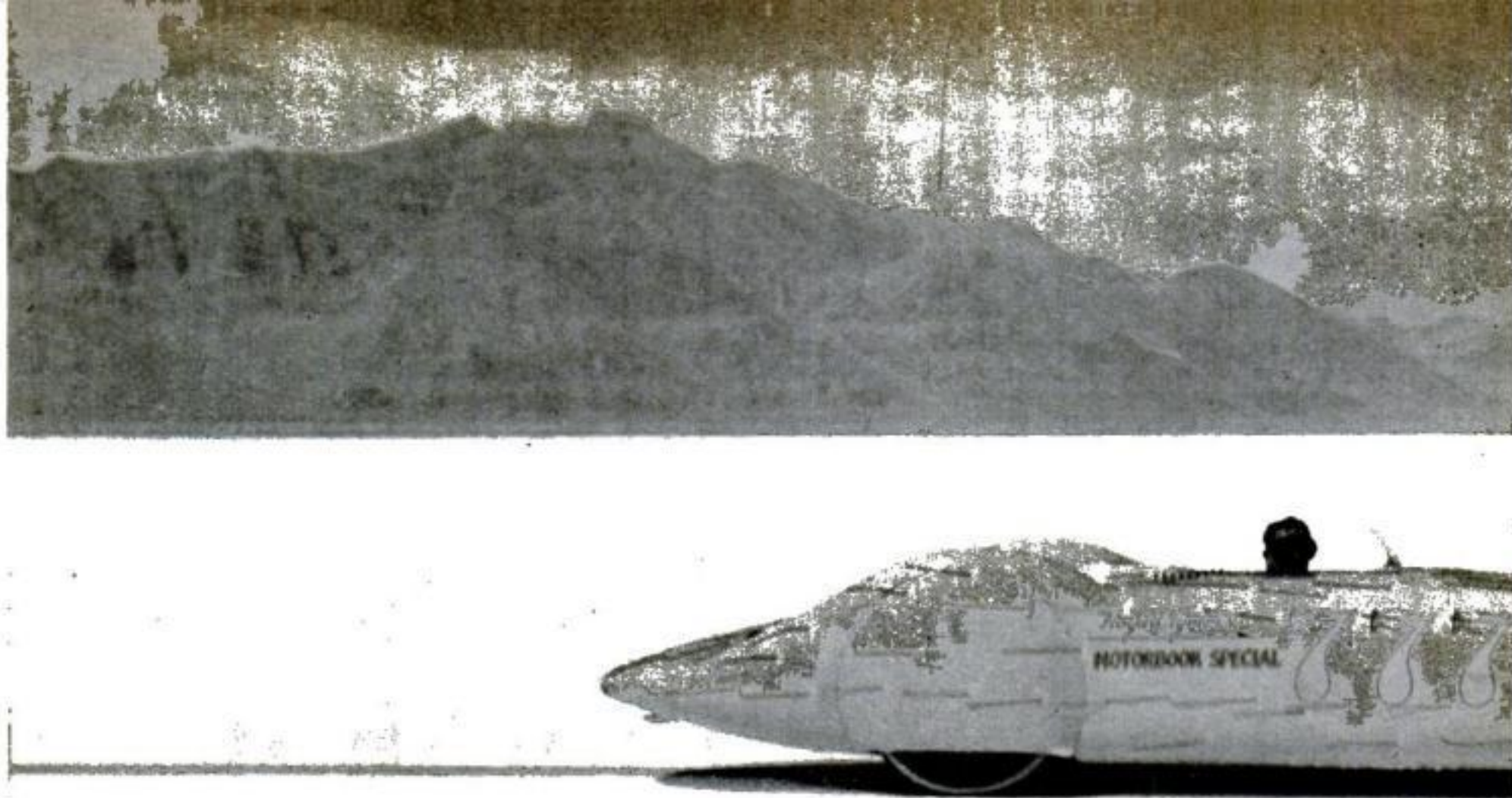
Navy Tests Tailless Jet

ONE of the Navy's newest jet fighters, the F7U Cutlass, is seen at left being catapulted aloft from the carrier *Midway*, in an initial trial at sea. Two axial-flow gas turbines propel the swept-wing tailless craft, which carries vertical fins at about the midpoint of each wing's trailing edge. Leading edges have full-span slots. The plane has a 39-foot wing span, 40-foot length, and a gross weight of 20,000 pounds.

Two-Eyed Camera Gets All the Data

A DEVICE's mechanical and electrical action may be studied simultaneously with a new two-lens model of the Kodak High Speed Camera. On the same film, one lens pictures the device itself; the other, the luminous trace of an oscilloscope electrically connected to it.





Champion Hot Rod

By Andrew R. Boone

POWDER blue, streamlined No. 777 whirled smoothly down the straight-away, its twin V-8s singing in harmony.

"Two two seven point four eight one for the quarter," blared the loudspeakers. And moments later: "Two three oh point seven six nine two for the mile."

A hot rod had just skimmed a quarter-

mile at 227, and *continuing to accelerate*, finished the measured mile faster than 230 miles an hour. On Utah's Bonneville salt flats, where Ab Jenkins and other speed greats set earlier records, a homemade car had whipped up nearly four miles a minute. Later in a two-way measured run it set an official hot-rod record of 221.4795 m.p.h.

To look at it, you'd think No. 777 was a costly custom job. But it's strictly hot rod

THESE ALSO RAN



Tiniest entry was 550-lb. Crosley with body from 165-gal. belly tank. Owner-driver Bob Alberts of San Jose, Calif., must remove shoes before easing into cramped cockpit. Four-cylinder engine puts out 50 hp. at 7,500 r.p.m. to get 98 m.p.h. Car won special O Class cup.



Chrome covers nearly all the metal, including the '24 Model T Ford frame, in Woody Lee's 1,600-lb. hot rod, which appeared at Bonneville for first time this year. Car, which hails from Oakland, Calif., has hit 131 m.p.h. Note overhead roll bar—sometimes a life saver.

Hottest hot rod streaks across Utah's bleak Bonneville salt flats in a trial run. Strands of yarn taped to its sleek skin show smooth flow of air over speedster's streamlined body.

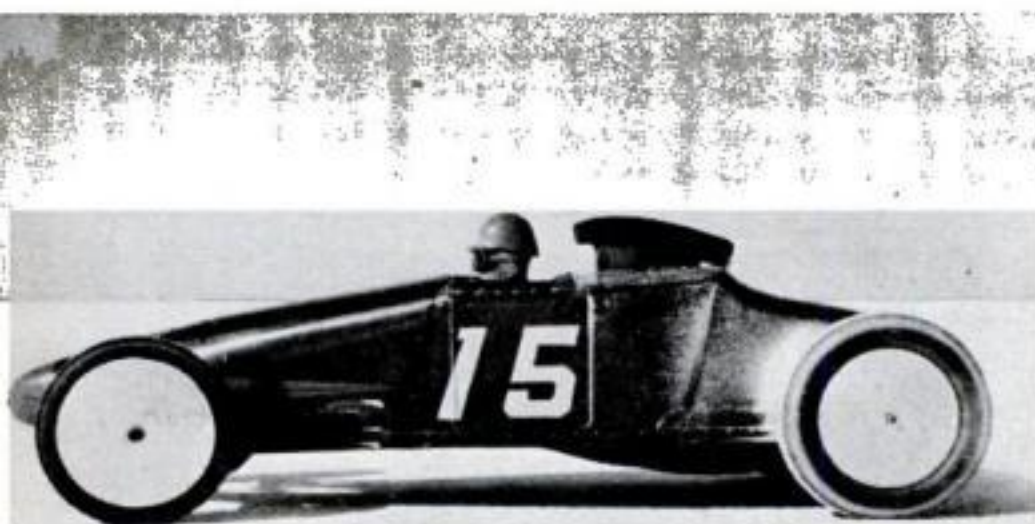


Hits 230 M.P.H.

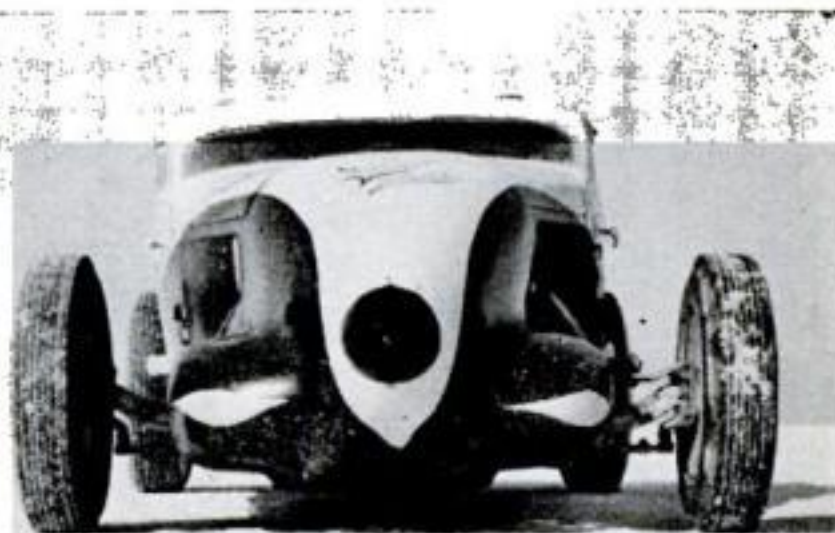
by accepted standards: production engine and stock body, modified if desired. Originally the car had a Model A pickup body. Then, its designer-builders, Bill Kenz and Roy Wesley, started making changes on it in their Denver automotive shops. More than once their sleek job has been clocked at 175—running on the rear engine alone. To check the streamlining before the final run, Kenz and Wesley studied movies, made

from a Cadillac convertible speeding alongside, that showed how black yarn taped to the body waved in the slipstream.

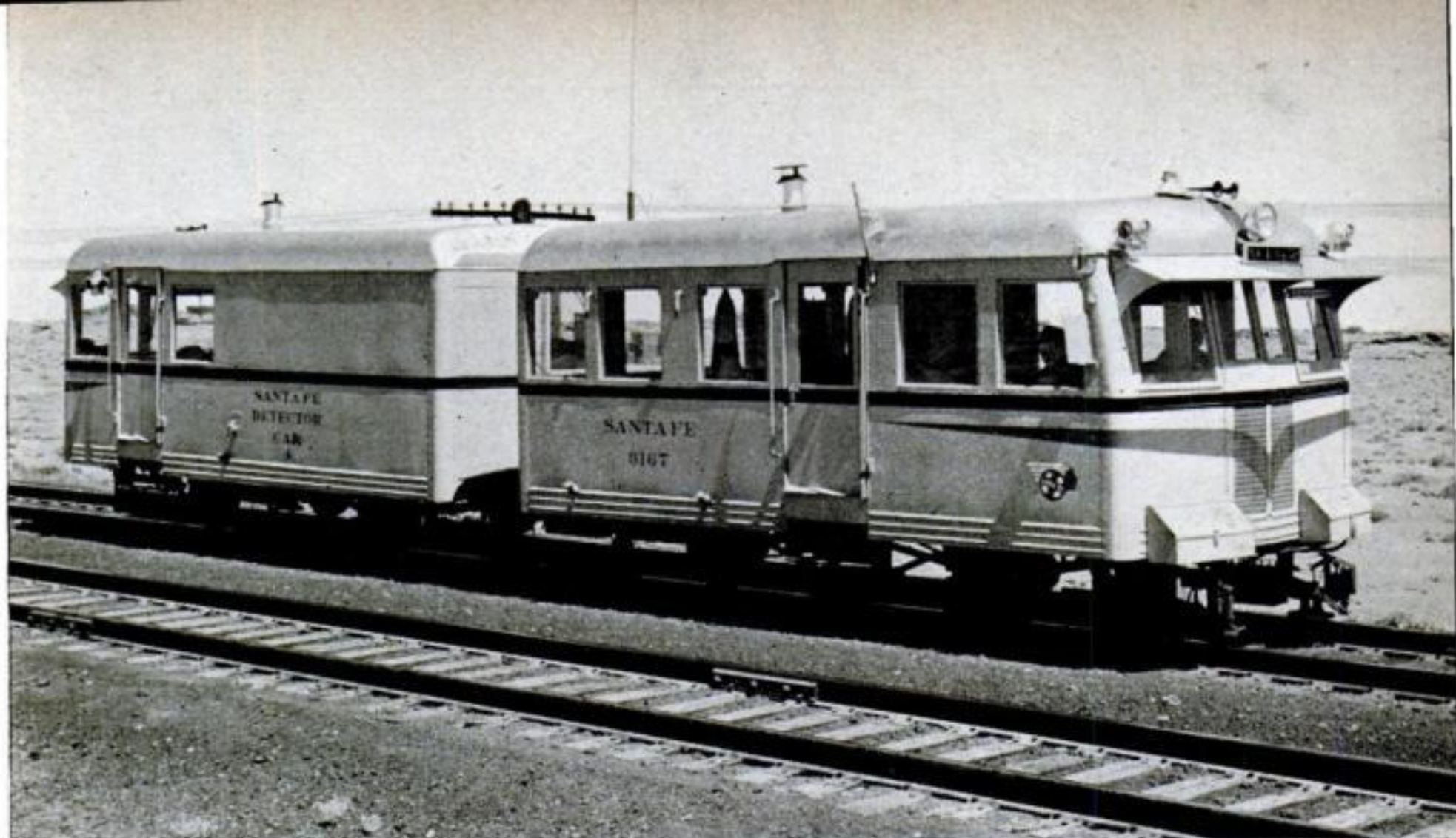
For its record run, No. 777 showed its exhausts to 200 other hot rods from 10 states in the third annual Bonneville National Speed Trials, sponsored by the Southern California Timing Association. Several of these cars will be shown at the Los Angeles Motorama this month. **END**



Jet assist from six exhaust stacks helps Akton Miller's 1,560-lb. job clip off 168 m.p.h. in C Class, 167 in B, using different Mercury engines. Air turbulence helps scavenge engine, reduces back pressure. Whittier, Calif., car has chopped '27 Model T body on home-built tubular frame.



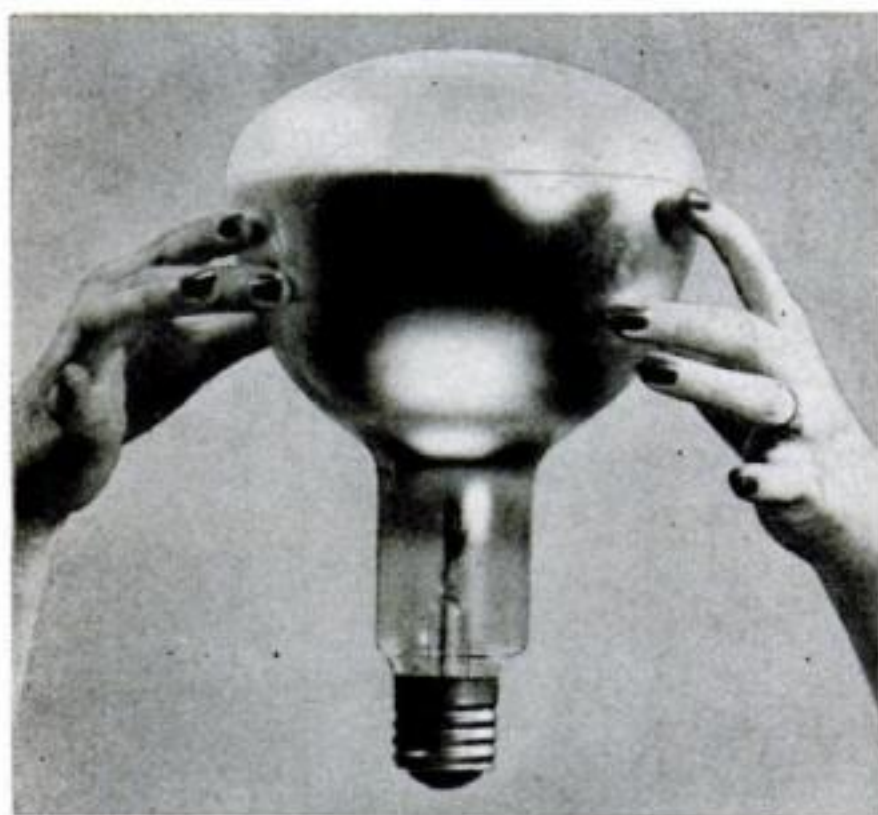
Novi-style front on this 130-m.p.h. C-Class speedster was made from six Chevie fenders welded together with a reversed headlight to form the nose cone. Originally it was a '34 Ford coupe, but channeling and top-chopping by Gordon Vann have lowered car 16 inches.



Detective Trains Spot Faulty Rails

ELECTRONIC trackwalkers, using the latest type of magnetic detecting gear, are snooping out faulty rails along 142,000 miles of track in the West and Southwest.

Moving at only six miles an hour, the special two-car Santa Fe detector trains pass powerful electromagnets along the rails. The magnets set up a magnetic field



Light Bulb Has Own Reflector

A NEW electric light for use in big industrial plants has a built-in reflector similar to that in the familiar Sealed-Beam automobile headlight. Put in the bulb itself, it eliminates the need for an outside reflector. The manufacturer, Westinghouse Electric, says the 800-watt light will burn for about four months on a two-shift factory operation, or half again as long as the 750-watt light now in general use.



Jet Fighters Get Tank Fins

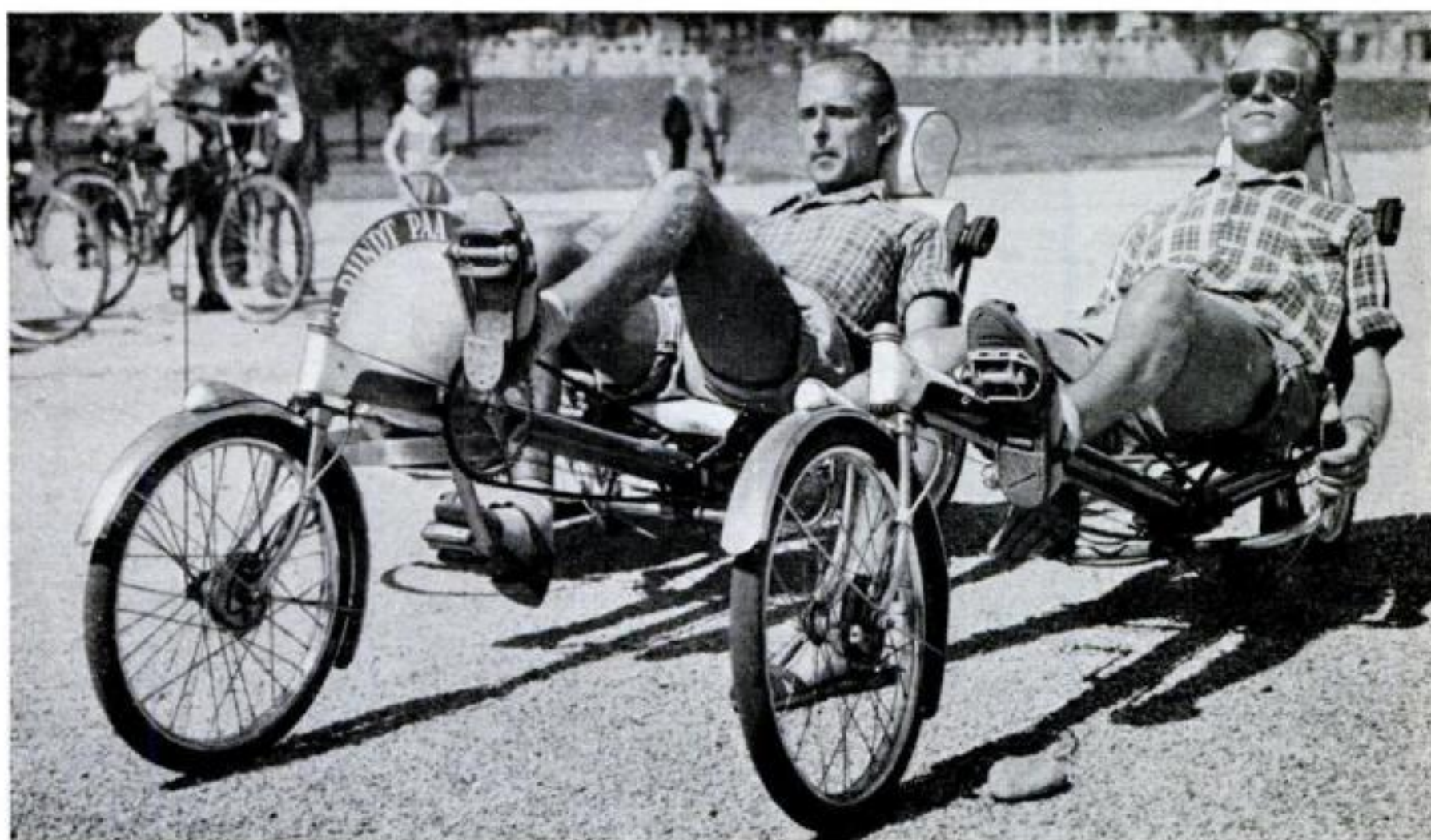
Now they're putting wings on wing tanks. When bigger wingtip fuel tanks were added to the Air Force Lockheed F-94 jets that guard the air approaches to Japan, stubby horizontal stabilizers were attached to them. The additional surface, in effect lengthening the wing a few inches, was necessary to maintain the side-to-side stability of the plane with the added outboard weight. The planes are flown by the 314th Air Division.



at any defect in the rail, and a following coil generates a small electric current when it passes through the field. Fed into an amplifier, the current then operates moving pens that record the voltage surges on a paper tape (above left).



When a defect is discovered, the train is stopped and the rail is hand-checked by passing a heavy current through the suspected section (above right). The amount of voltage drop at the break shows the seriousness and exact location of the flaw.



"Bed Bikes" Save Work

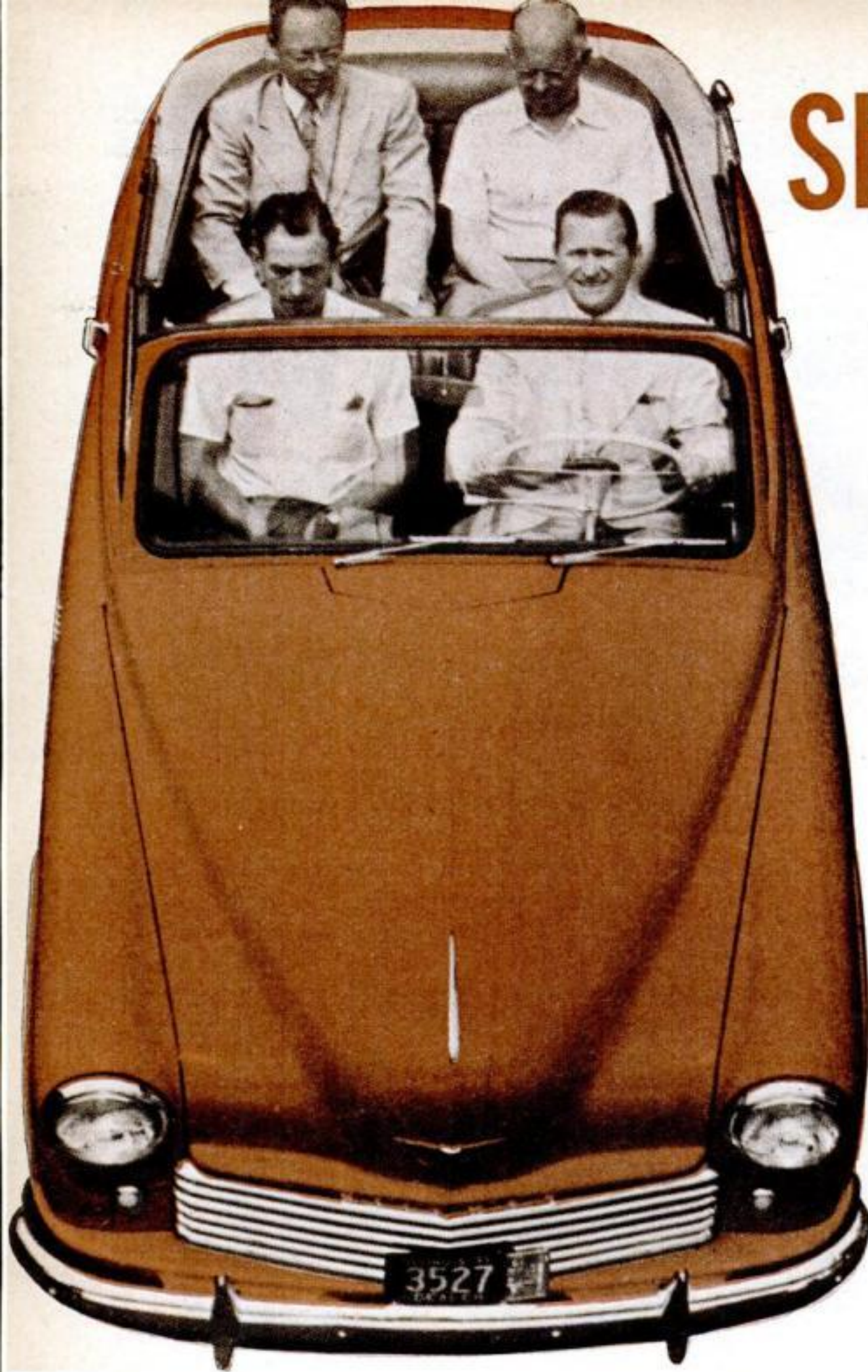
THESE two cyclists, lying down on the job, are brothers Svend and Knud Nielson of Copenhagen, Denmark. Off on a trip around the world by leg power, they were photographed in Munich, Germany. The

oddly designed vehicles, built by the owners themselves, are supposed to take the work out of pedaling. The Nielsons, who began their trip in mid-summer, expect to complete it in three years, financing themselves by peddling pictures of the bikes.

Shaw Drives

Saucy like its name, the little Hillman gets a lot of oomph out of a few horses—and gives you comfort and economy to boot.

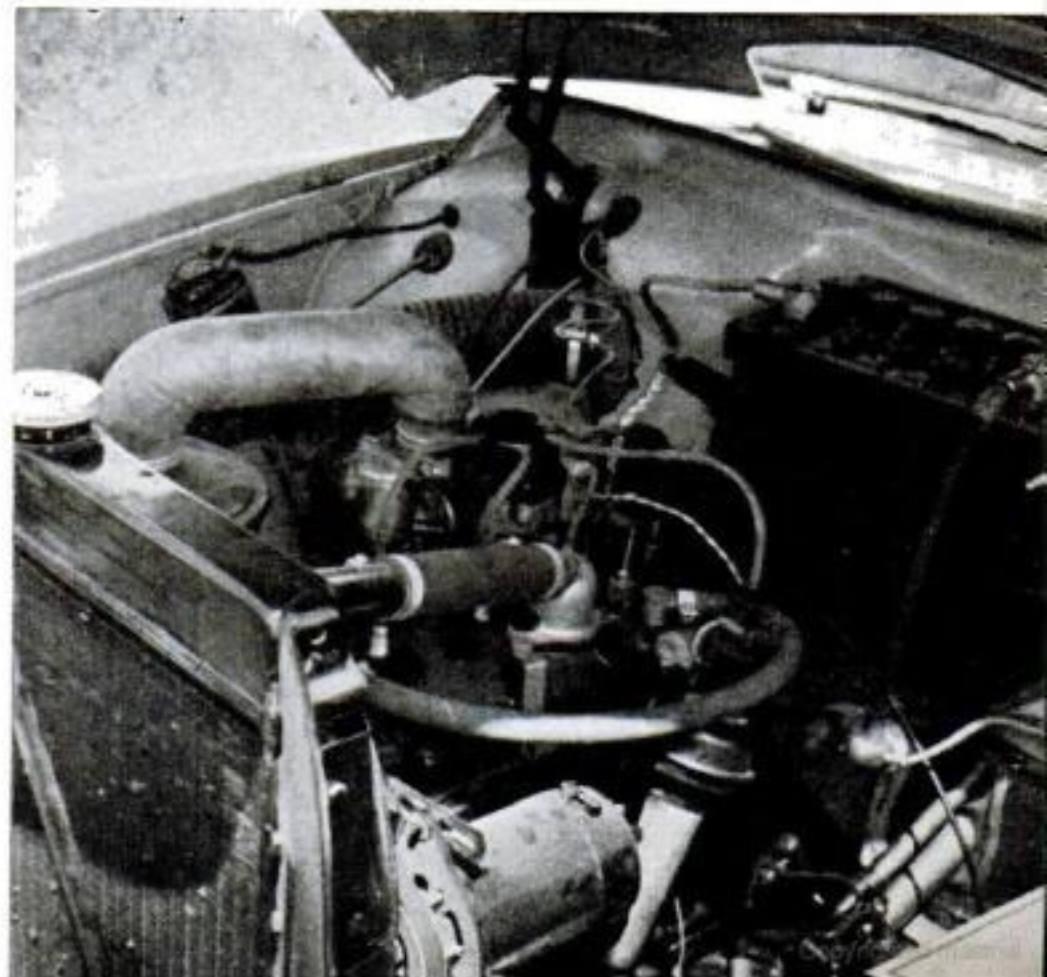
By Wilbur Shaw



European-type turn signal is, I'd say, no more effective than our blinker system, but it's fun to work and a lot more gadgety. This convertible sells for \$1,849 unloaded from the boat at any port and ready to roll.

With a wheelbase of only 93 inches, the Hillman Minx provides a commendable amount of room for four people. The windows roll up and down with only one revolution of the handle. The gas economy is good: 30 to 32 miles per U. S. (not British) gallon.

The engine runs faster than those of most U. S. cars—as it must, to develop the torque needed for good performance. It's interesting to note that while the British are free with their criticism of our "over-powered" cars, they too have been steadily boosting their horsepowers. Nineteen years ago the ancestor of this Minx engine developed only 27 horsepower. This one delivers 42 hp. at 4,200 r.p.m.



the Minx—"A Neat Little Car"

THE Hillman Minx is a neat little car by any standards, British or American.

I specify that now, before I make any criticism of this popular, English-tailored automobile. Some POPULAR SCIENCE readers really got their dander up over what I said about the Austin and the Henry J last spring.

Marketed in this country by the Rootes Group, the Minx does have its limitations *judged by the demands of motoring on a big continent covered by high-speed roads*. With that understood, let's climb aboard.

Here's the start of the playback from my recording equipment as I slipped into the driver's seat of a Minx four-door sedan at the Indianapolis Motor Speedway.

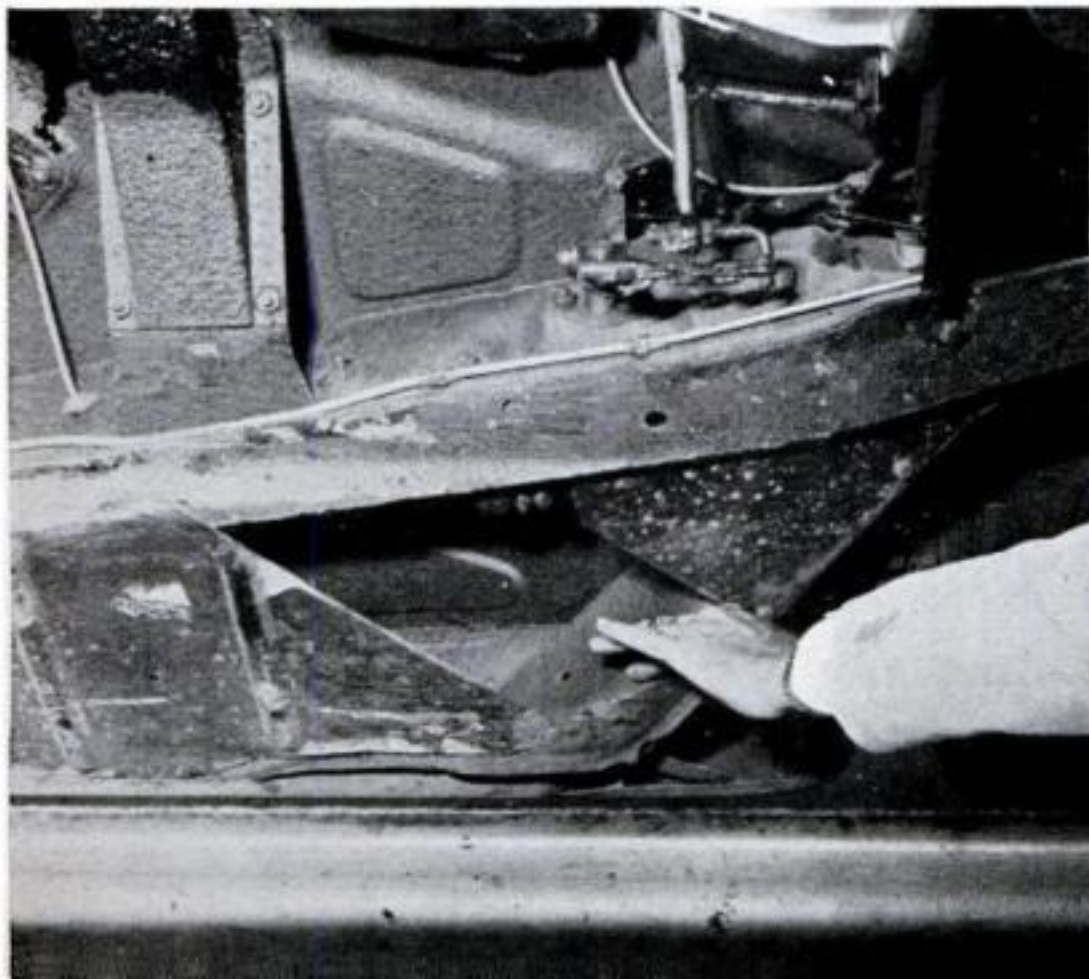
Roomy and Gimmicky

I'm always surprised to discover the amount of entrance room the British build into their little cars . . . you don't have to stoop and squat to get into the Minx . . . and here are those battery and oil-pressure lights that we ought to see on more U.S. cars . . . A green light flashes on if the oil pressure is low, a red light if the battery is on discharge . . .

I pulled on the starter button—that's right, you pull instead of push it—and got the engine to turning over.

The starter's too noisy . . . which is typical-

Here's a look at the underside of the Minx chassis. My hand is on a subframe welded on the outside of the regular frame. It serves as a splash member and adds to the rigidity.

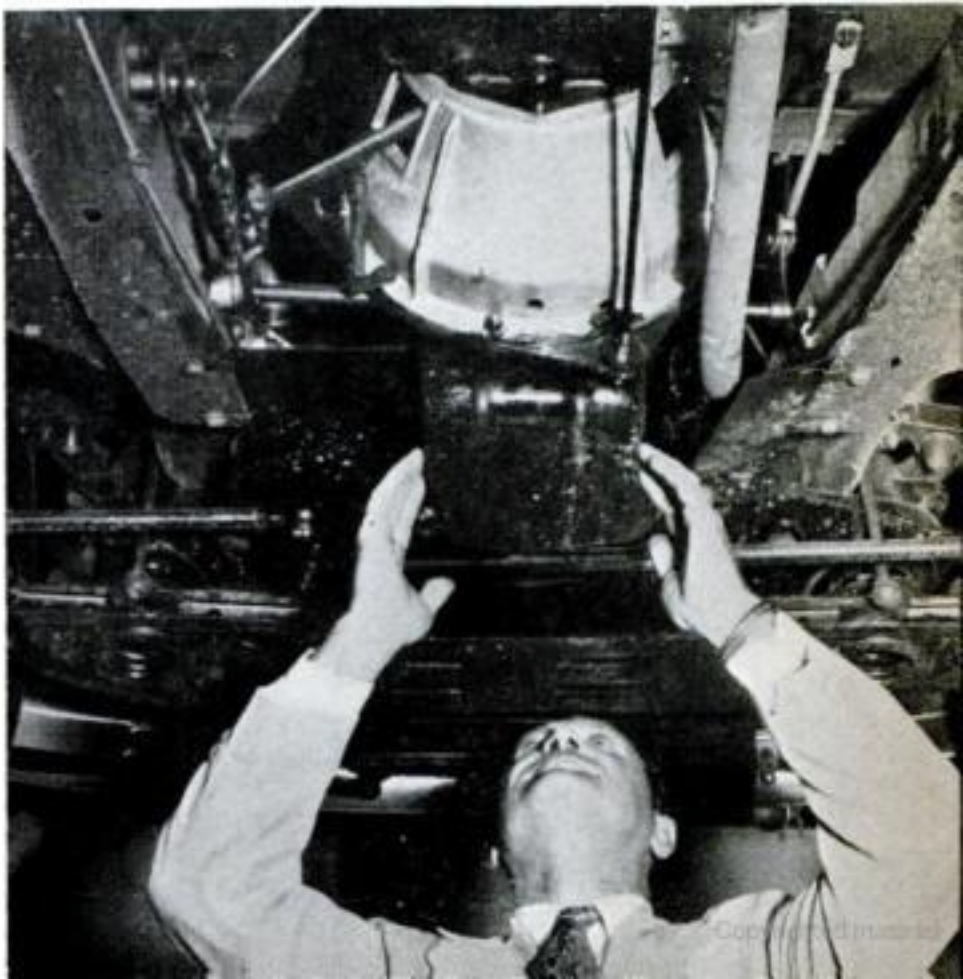


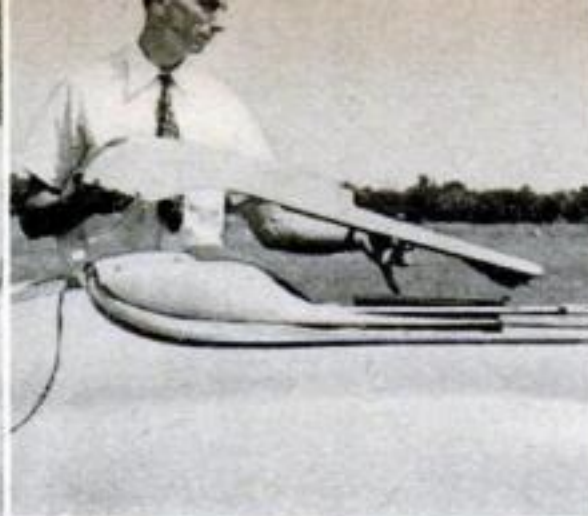
The instrument panel is well laid out. The Minx has a nice safety provision on its gear-shift—you have to pull lengthwise on the shift lever before you can get into reverse.

ly British . . . but the engine catches right now . . . There's plenty of leg room in front as I feel for the clutch . . . but the car obviously gives the rear-seat passengers a snug fit . . . and that's what I mean by its limitations.

I started around the track, using only the second, third and fourth gears to get torque at the rear wheels. You use first gear only for a hard-pull start—if, for instance, you are

The little crankcase is exactly nine inches square. We had a time getting the car onto a filling-station hoist because of its narrow tread. The tires squeaked on the safety rails.





To put up the top—the “hood” to the British—you first have to remove three thin, steel cover plates over the top well. They are shown in position in the picture at the left. The top has

a tricky, hinged framework that has to be adjusted manually. But when the fabric is buttoned down, the convertible is about as snug as this type of car can be.



To save space, the emergency-brake handle is on the floor. For U. S. market, the Minx comes with left-hand drive.



This port lets you check your lube level in gearbox. Incidentally, car is not equipped with automatic choke.



Built-in jack posts are a feature of the Minx, as of many other European cars. Spare tire has own compartment.

headed up a hill and need plenty of torque.

The engine revs up considerably . . . as it must with the car's power/weight ratio . . . but it's quite smooth for a four-cylinder job . . . The ride is surprisingly soft.

I did some hard turns at an indicated 60 miles an hour on the broad Speedway track.

There's no perceptible roll . . . This is an amazing little car . . . It keeps its feet on the ground . . . For less than a ton of automobile, it has an odd, comforting feeling of weight . . . The visibility through the windshield is excellent . . . you don't have to look

[Continued on page 268]

FACTS ON THE HILLMAN MINX

Make and model: Hillman Minx Mark IV 4-door sedan.

Engine: 4 cyl. L-head; 42 hp. at 4,200 r.p.m.; car weight per hp., 47.5 lb.; bore and stroke, 2 9/16" by 3 3/4"; compression ratio, 6.63:1; piston displacement, 77.2 cu. in.

Engine piston travel: (in feet per car mile at 20 m.p.h.)—2,670.

Crankshaft bearing surface: 25.62 sq. in.

Torque: 58.3 lb.-ft. at 2,200 r.p.m.

Transmission: 4-speed manual.

Rear-axle ratio: 5.22:1.

Steering ratio: 14.6:1.

Radius of turning circle: 16 1/2'.

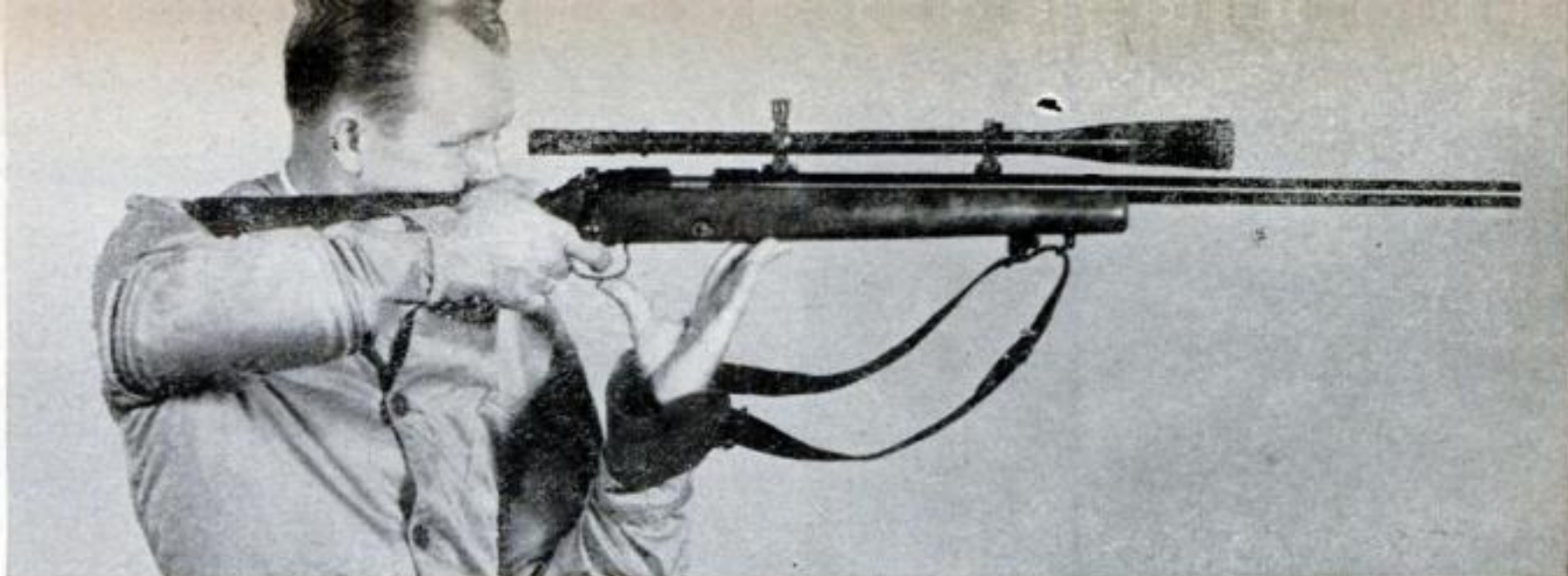
Effective brake-lining area: 92 sq. in.

Springs: front, coil; rear, semi-elliptic.

Weight and outside dimensions: 1,995 lb.; height, 60"; over-all length with bumpers and guards, 157.25"; width, 62"; wheelbase, 93"; overhang, front 24", rear 39 1/4"; tread, front 48.6", rear 48.5".

Inside dimensions: seat-cushion width, front 50 1/4", rear 40 1/4"; leg room, front 39", rear 25 1/2"; headroom, front 37 1/4", rear 36 1/2"; seat height, front 12 1/4", rear 15"; vertical distance, steering wheel to seat cushion, with seat in mid-position, 7"; front-seat adjustment, horizontal 5 1/2" (no vertical seat adjustment).

Tire size: 5.50 by 15.



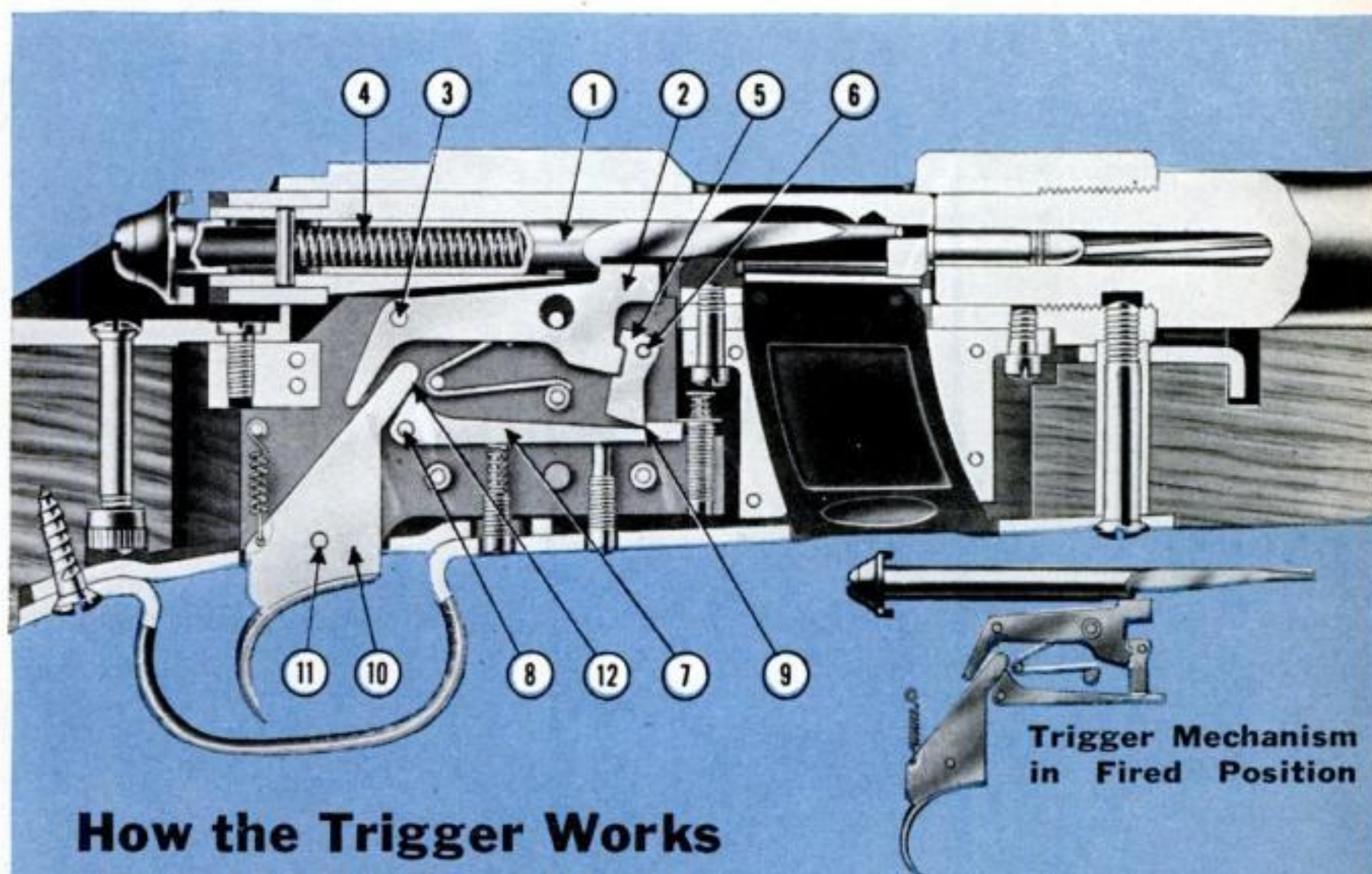
Dave Carlson, former national smallbore champion, tests the new "Micro-Motion" trigger.

New Rifle Trigger Cuts Vibration

MOVING the trigger as little as three thousandths of an inch is enough to fire a new marksman's rifle. This faint pull is multiplied nearly five times by a system of levers to provide the fairly large movement necessary to disengage the sear that holds the firing pin back. The new design,

says the manufacturer, practically eliminates aim-spoiling trigger vibration.

Screw adjustments underneath the rifle permit the marksman to vary the stiffness of the trigger and the total distance it moves. It is a feature of Winchester's latest .22-caliber Model 52.



How the Trigger Works

The firing pin (1) is held in cocked position by sear (2), pivoted on pin (3). The sear tends to move downward due to thrust of firing-pin spring (4) and thus release firing pin. This is prevented by rocker (5), pivoted on pin (6), which blocks downward movement of sear.

The downward thrust of the sear tends to rotate rocker counterclockwise. This movement is stopped because trigger lever

(7), pivoted on pin (8), catches rocker on hook (9).

Trigger (10), pivoted on pin (11), engages rear end of trigger lever at (12). When trigger is pulled, its upper end presses on trigger lever, causing front end of lever to move down, releasing rocker and permitting sear to drop. Firing pin, propelled by firing-pin spring, flies forward to fire cartridge.



Signal Lights Guide Bomber for Night Air Refueling

IN DAYLIGHT or darkness, U. S. Air Force bombers can now refuel in mid-air (above) to gain range and striking power. Newly developed signal lights on the belly of the tanker plane (left) direct the tricky maneuver. Through microswitches, the position of the tanker's telescopic refueling boom controls the signal lights automatically. When the boom is extended and at the correct angle, a panel at the center of the signal board displays a green light to the bomber pilot. If the green light goes out, and one of four red panels lights up, the bomber is getting out of position. The red panel tells the bomber pilot whether to move up, down, forward or aft to avoid breaking the connection.

Wreckproof System Safeguards Commuters

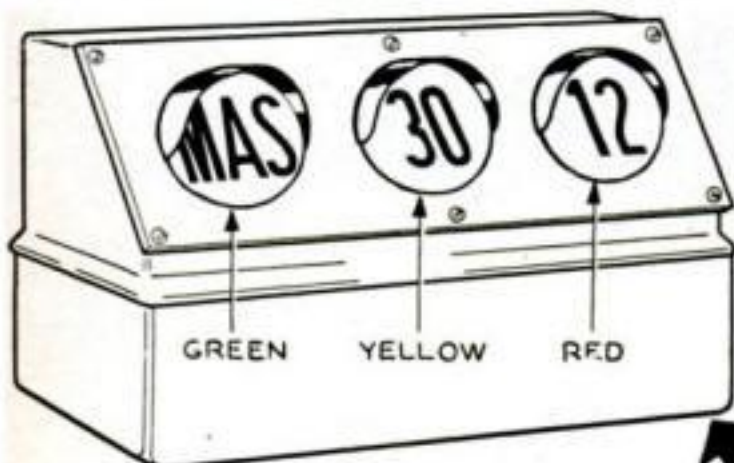
ON AN 18-mile stretch between New York City and Port Washington, N. Y., Long Island Rail Road trains now run under automatic speed control, the first installation of this "wreckproof" system by the world's busiest commuting railway. Completion next year of 73 miles of similarly equipped lines will safeguard passengers on other routes to the suburban communities of Long Island.

The Long Island's system makes it impossible for a train to exceed 12 m.p.h. in an occupied block, or 30 m.p.h. approaching one. If an engineer disregards a speed-limiting block signal, a speed governor takes



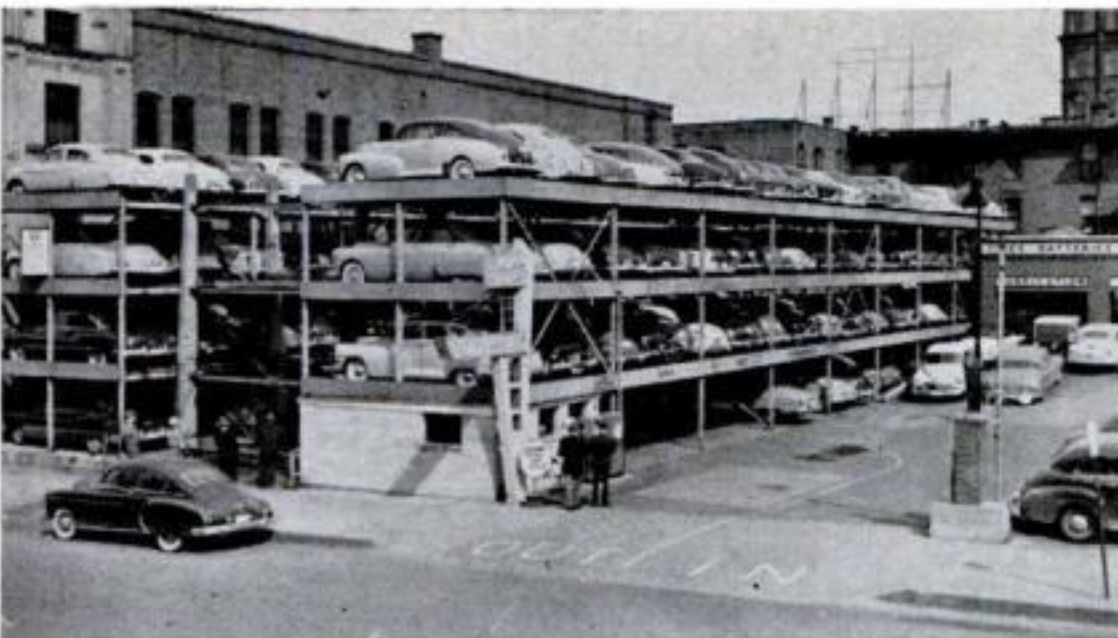
control away from him and applies the brakes. They cannot be released until the train slows down to a safe speed.

Minor differences from a similar new Pennsylvania R. R. system (PS, July '51, p. 50) are a two-speed instead of a three-speed governor, and cab signals with letters and numerals instead of semaphore symbols.



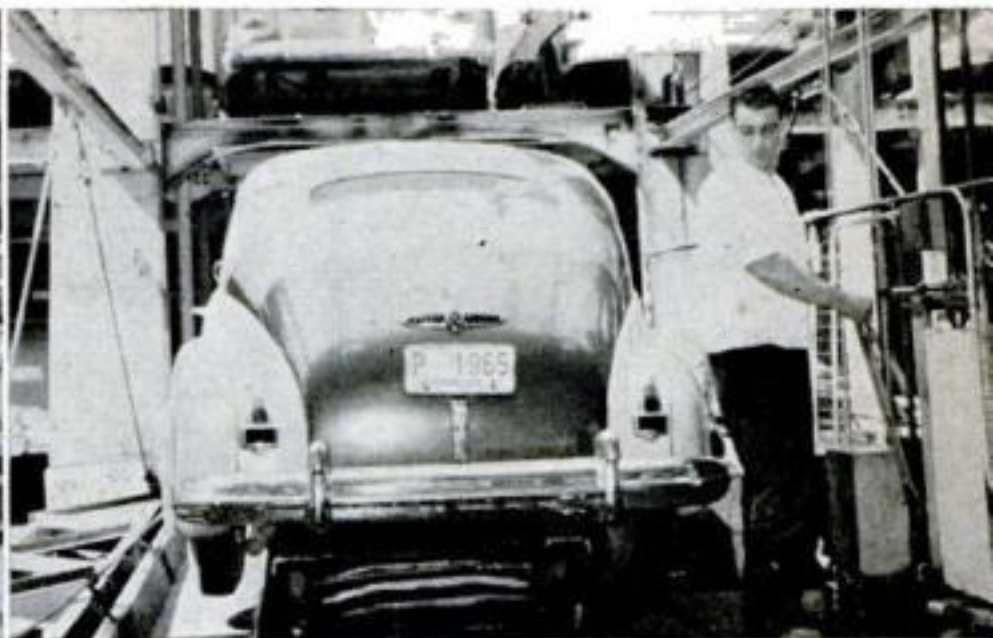
Signals in engineer's cab of Long Island multiple-unit electric car repeat wayside block signals that show either maximum authorized speed (MAS), 30 m.p.h. or 12 m.p.h. If engineer disregards a signal requiring a slowdown, train's brakes function automatically.





Pigeonhole Storage Helps Solve City Parking Problem

A MOTORIST who leaves his car at this four-level parking unit in Spokane doesn't have to worry about scratched fenders. Once he drives into a street-level entrance stall, no one touches the car until he returns. An elevator moving along an alley between the two storage tiers stops in front



of the car waiting to be parked. A dolly slides out, raises the car 10 inches off the ground, and loads it on the elevator. The operator then moves the elevator along the alley and up to the level where the dolly deposits the car in a vacant pigeonhole. In photo at right above, operator is moving a car out of its pigeonhole for delivery to a customer.

Balloon Locates Towers

ENGINEERS used this Kytoon (kite-balloon) to measure height of relay towers for a line-of-sight microwave communications system along the Southern Pacific Railroad in Oregon. When men over the ridge say they see the balloon, markings on the string show the tower height.



75 years ago this month

Popular Science Monthly reported:

"AFTER a very thorough investigation of the advantages possessed by different kinds of pavements—granite, asphalt and wood—the corporation of London has decided in favor of the last. The report of the city engineer shows that a horse traveling on a granite pavement may be expected to fall once for every 132 miles traveled, on asphalt once in 191 miles, and on wood once in 446 miles."

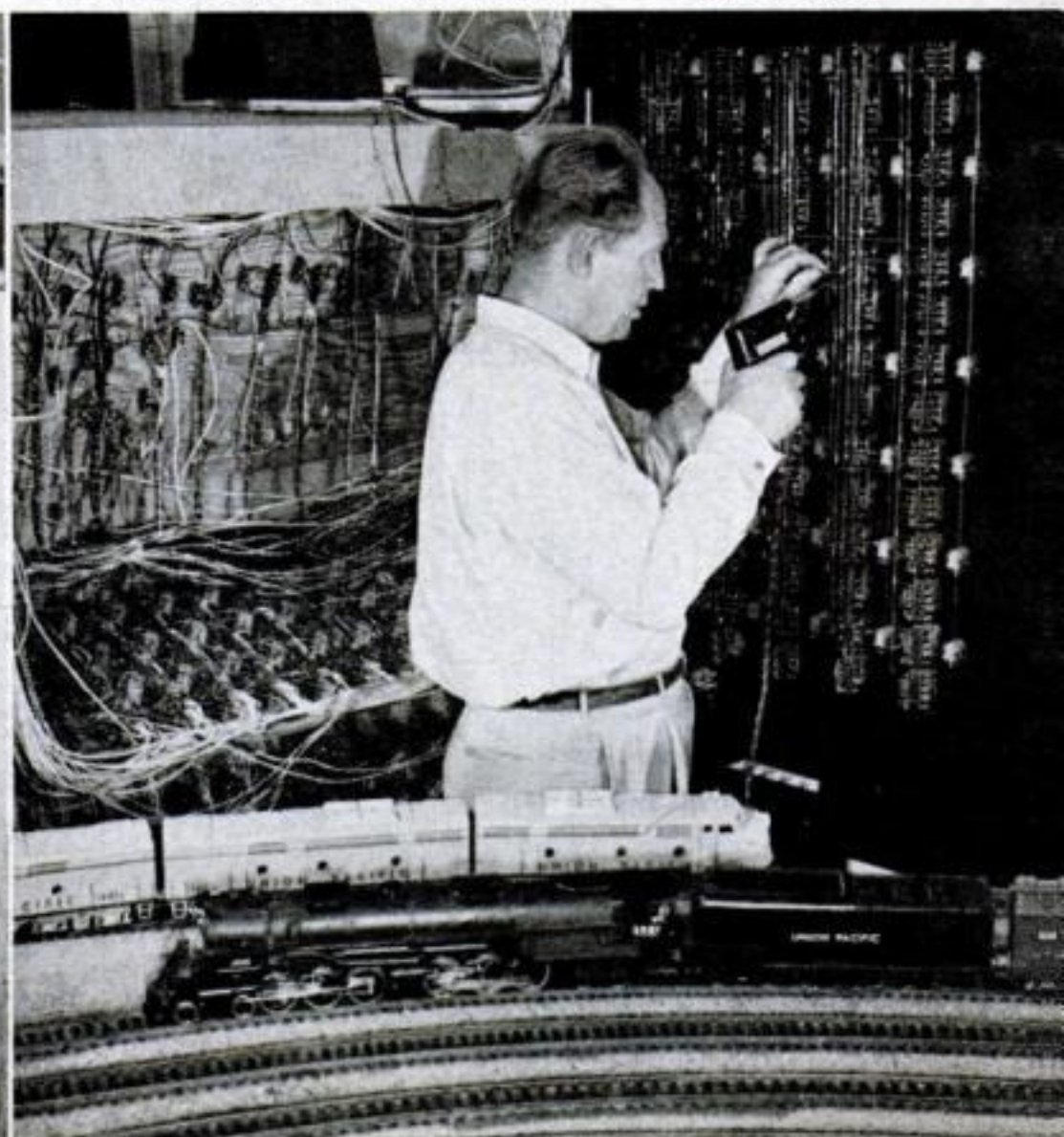


Comin' 'round the mountain, multiple-unit F-3 freight Diesel eases through precipitous

pass, modeled to represent part of Rockies. Bridge in foreground carries upper level of tracks.

From single control panel, Mr. Friedrich operates entire model railroad. Toggle switches, arranged on map of layout, actuate corresponding signals, switches and tracks on railroad.

Maze at rear of control panel is part of 300 relays and 11,000 feet of wiring that connect panel to tracks. In foreground are three-unit Diesel and big 12-wheel-drive UP Challenger.



His Private Railroad Rivals Best Big Lines

This California minister runs his mammoth model from an easy chair with real Centralized Traffic Control.

By Andrew R. Boone

SEVERAL evenings each week a California minister roams the western United States without getting out of his chair. He is James K. Friedrich, pastor of St. Michael and All Angels Episcopal Church, Studio City.

He tours thousands of square miles of desert plains and towering mountain peaks by simply flipping switches on a board of electrical controls. As he manipulates inch-long levers, model trains labor up long upgrades, pound around banked curves, and streak through tunnels in a railroad system that includes 3,300 feet of track, 28 locomotives, 50 passenger cars and 145 freight cars.

Occupying a room 30 by 50 feet, the O-gauge ($\frac{1}{4}$ -inch scale) railroad is believed to be the largest layout owned by one man.

Connections are soldered for a 24-volt, 1/20-hp. electric motor in main frame of big passenger Diesel. All locomotives were handmade from photographs and blueprints supplied by railroads.

Certainly it is one of the few club-size roads that can be run by a single operator sitting at a single, mammoth control panel.

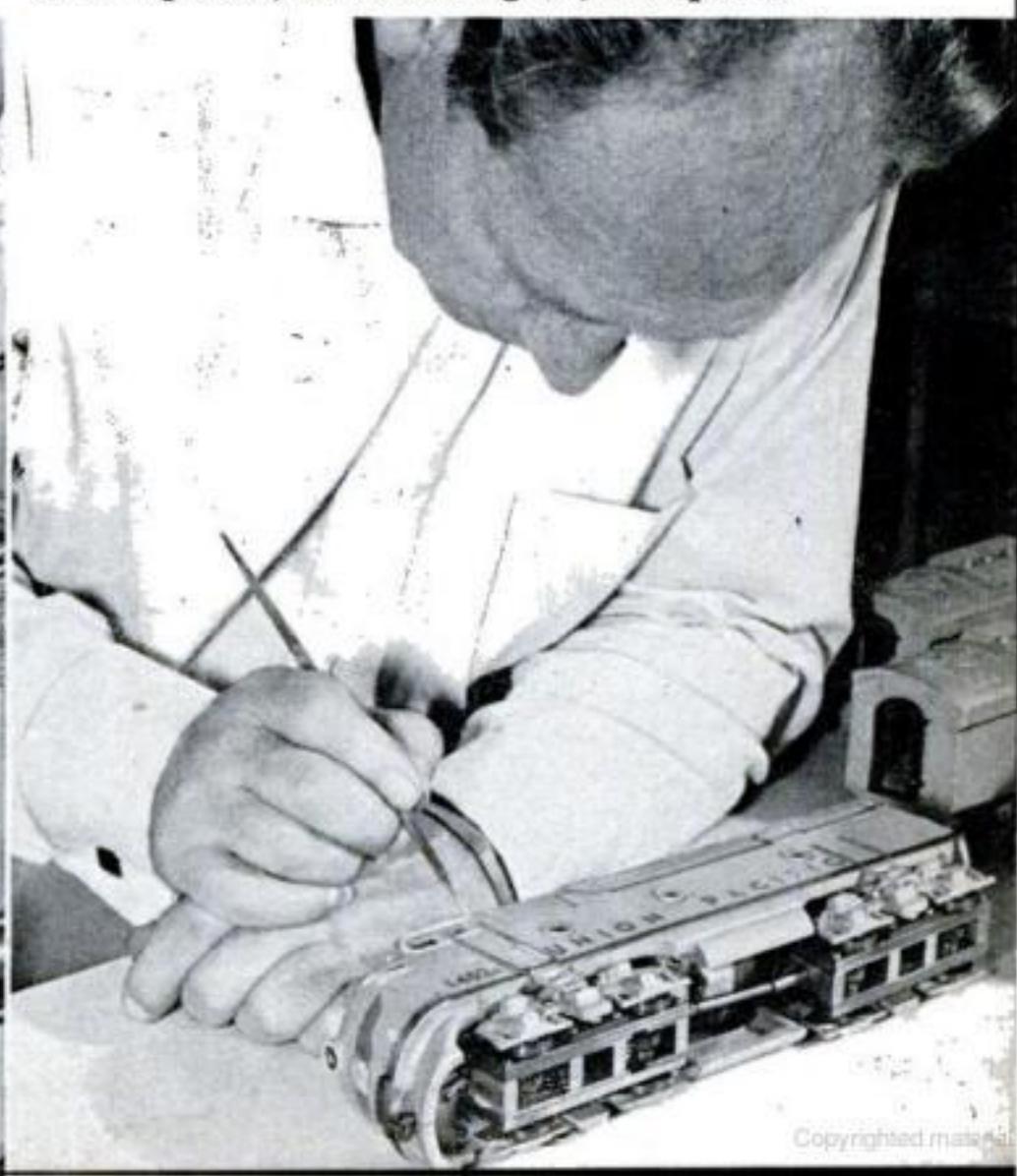
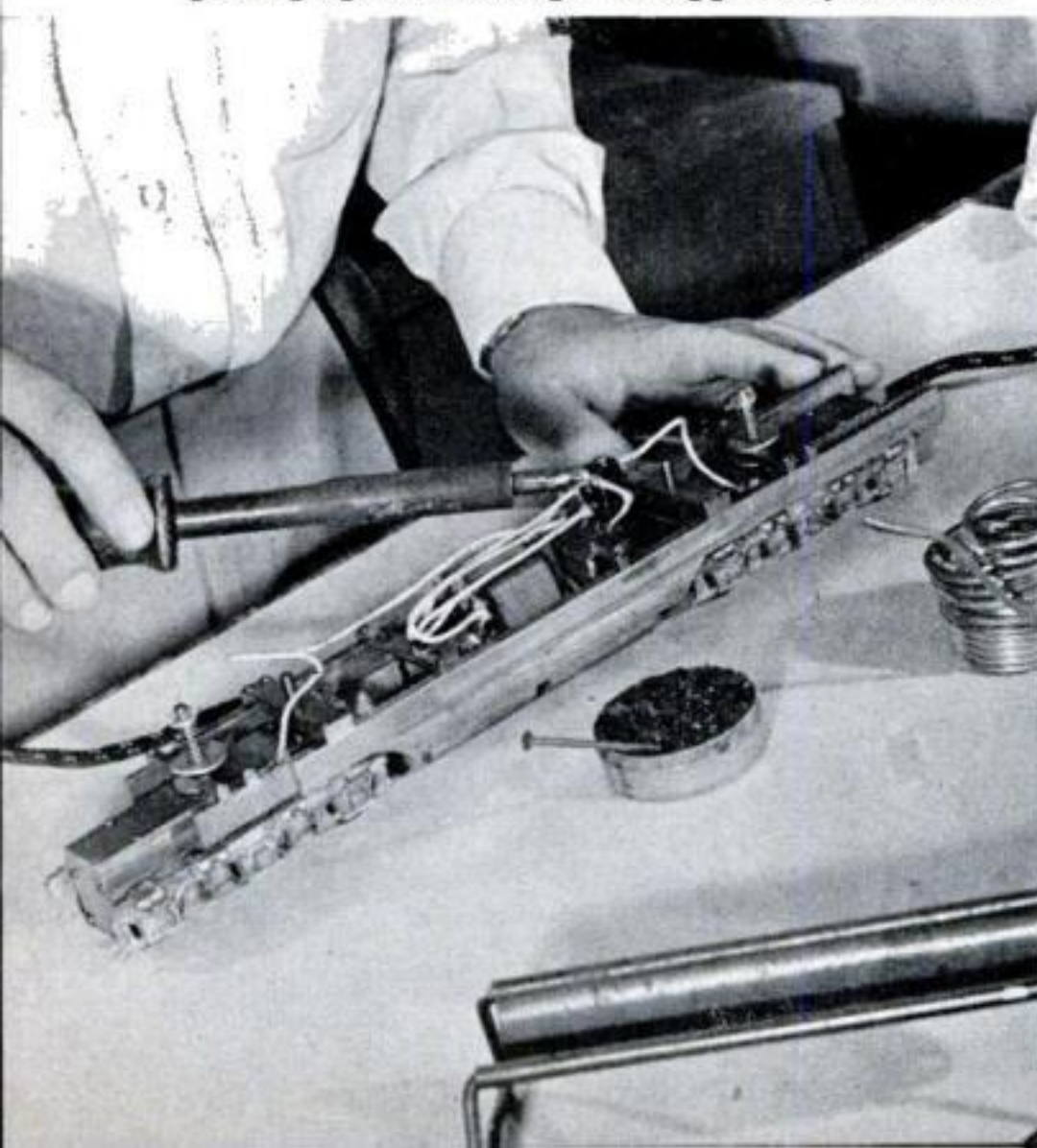
This is done through a miniature version of CTC—Centralized Traffic Control—the same system used by big railroads that permits one man to know and control the traffic over an entire division. Through 300 clattering relays that automatically actuate signals and turnouts, Mr. Friedrich can operate up to four trains simultaneously over the multiple-track system.

Can Run Railroad "Blind"

Scores of flashing indicator lights, arranged in map fashion on the panel, tell him exactly where every train is located at all times. Nearly 100 toggle switches enable him to turn power on or off in any section, so that each train can be started or stopped anywhere. Some sections are even powered through separate rheostats so the speed of each train can be varied independently.

If he wants to, Mr. Friedrich can run the

Multiple-unit F-3 freight Diesel gets delicate paint trim by professional modelmaker Lewis Upshaw. Union Pacific buys most of its models from Upshaw, some costing \$1,500 apiece.



railroad "blind," watching only the big, blinking control board to keep tabs on his trains.

The trains run over the full-scale equivalent of 50 miles of tracks. As a Southern Pacific freight heaves into view, rolling up a California valley, the tail light of a Union Pacific crack passenger express disappears around a Utah mountain. They're only 30 feet apart actually, several hundred miles apart scenically.

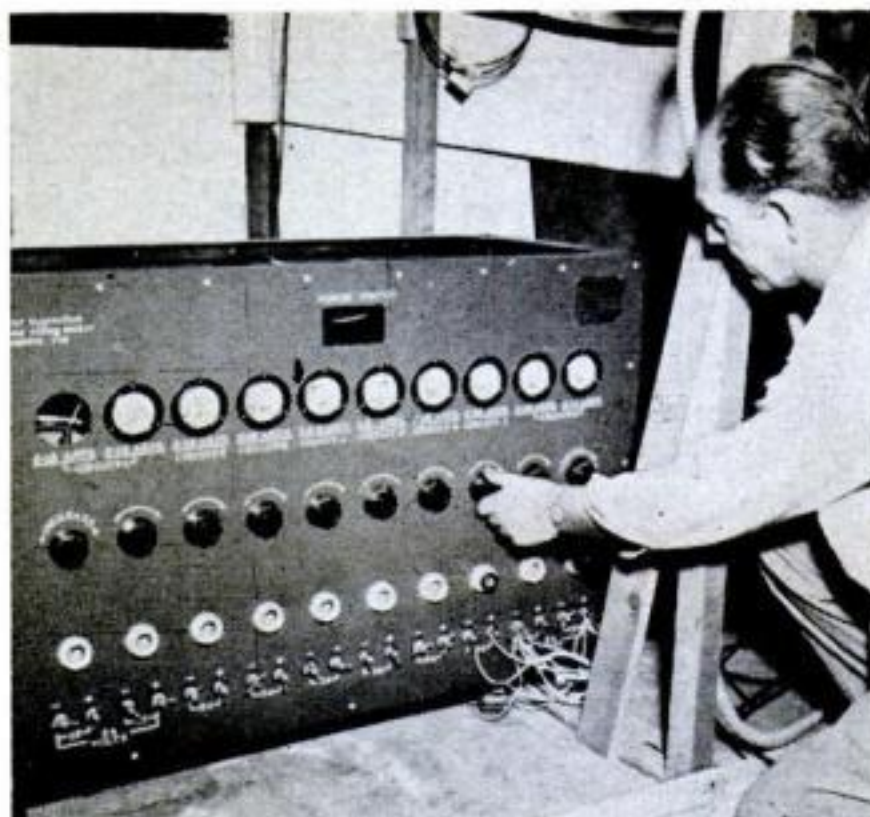
Rev. Friedrich didn't build his railroad out of the Sunday collection box. When he isn't tending his parish, he directs the making of religious movies as president of Cathedral Films, Inc., in Hollywood. Out of this enterprise has also come valuable experience in set design that has helped him create the scenic effects on his railroad.

Locomotives Made by Pros

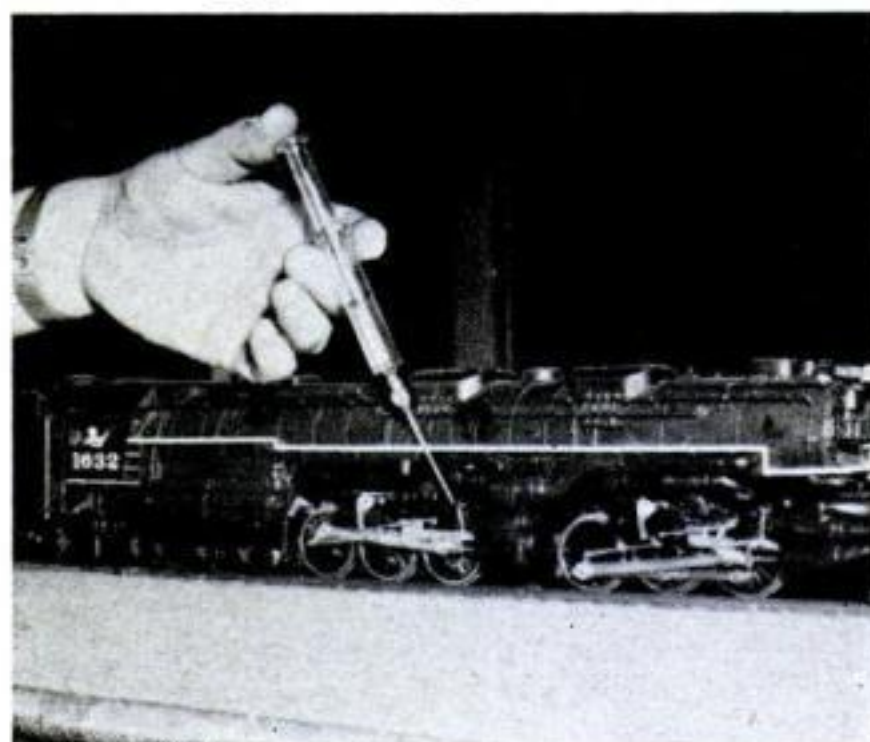
Mountains, valleys and arid deserts, artfully contrived out of painted paper and cardboard, provide a changing panorama of western scenery for the multi-level track system. Bridges, stations, farm homes and industrial buildings dot the landscape. Sprawling ladder-track classification yards are complete with roundhouse, turntable, water tanks and Diesel-servicing stations.

All of the 28 locomotives are precise, handmade reproductions built for him by two professional modelmakers, Lewis Upshaw and Ray Waller. They range from tiny switchers to giant multiple-unit road Diesels and mountain-climbing steam locomotives. Each is powered by a single 1/20-hp. electric motor that enables it to pull nearly 100 cars. That's as much as the real thing can do. **END**

Giant grain elevator carries out railroad's western motif. Mountains and clouds in distance

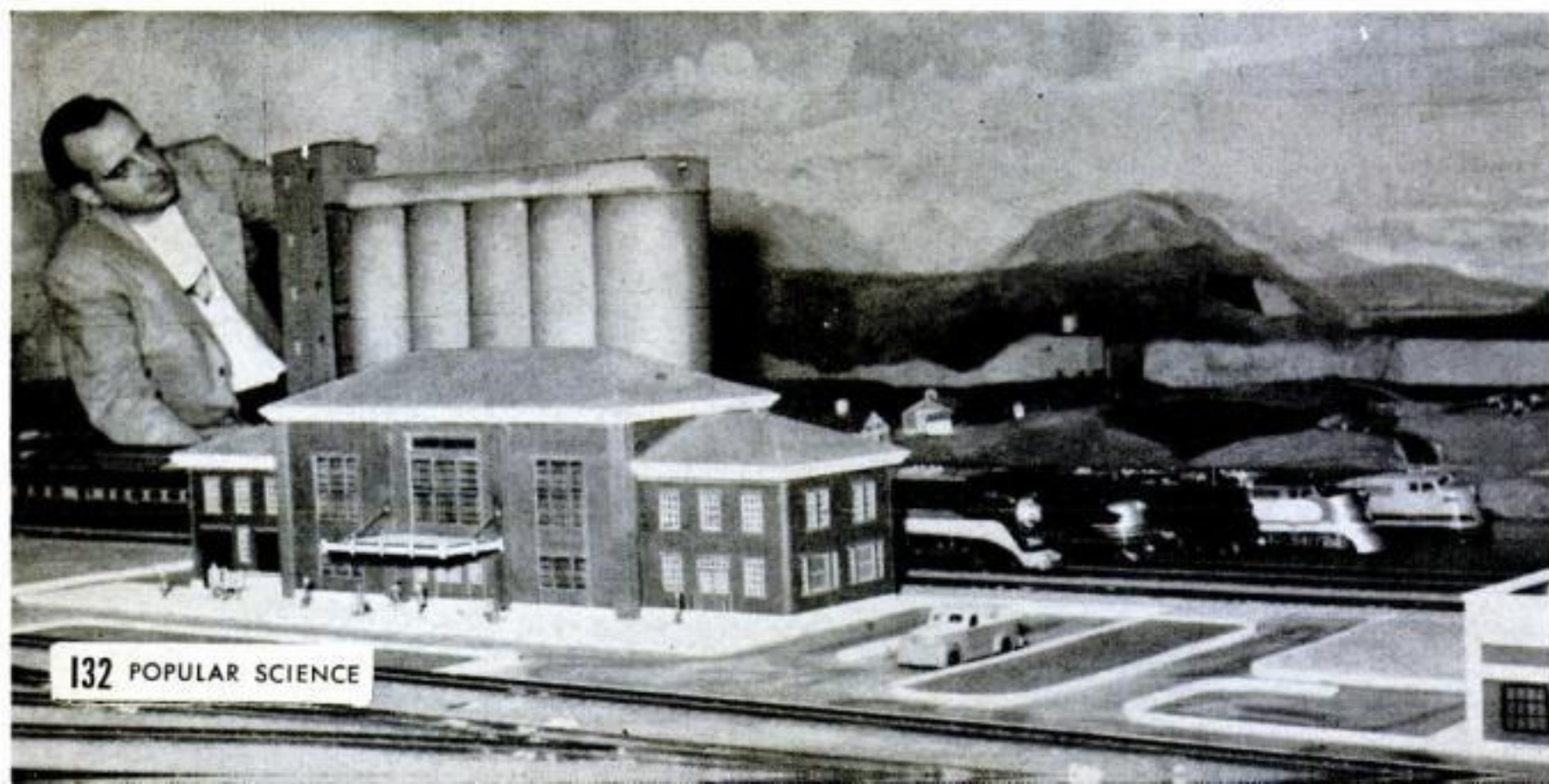


Huge power supply is war-surplus aircraft-battery charger. Its rectifier has 220-volt input, delivers 10 separate circuits of 24 volts each, and can supply 285 amps continuously.

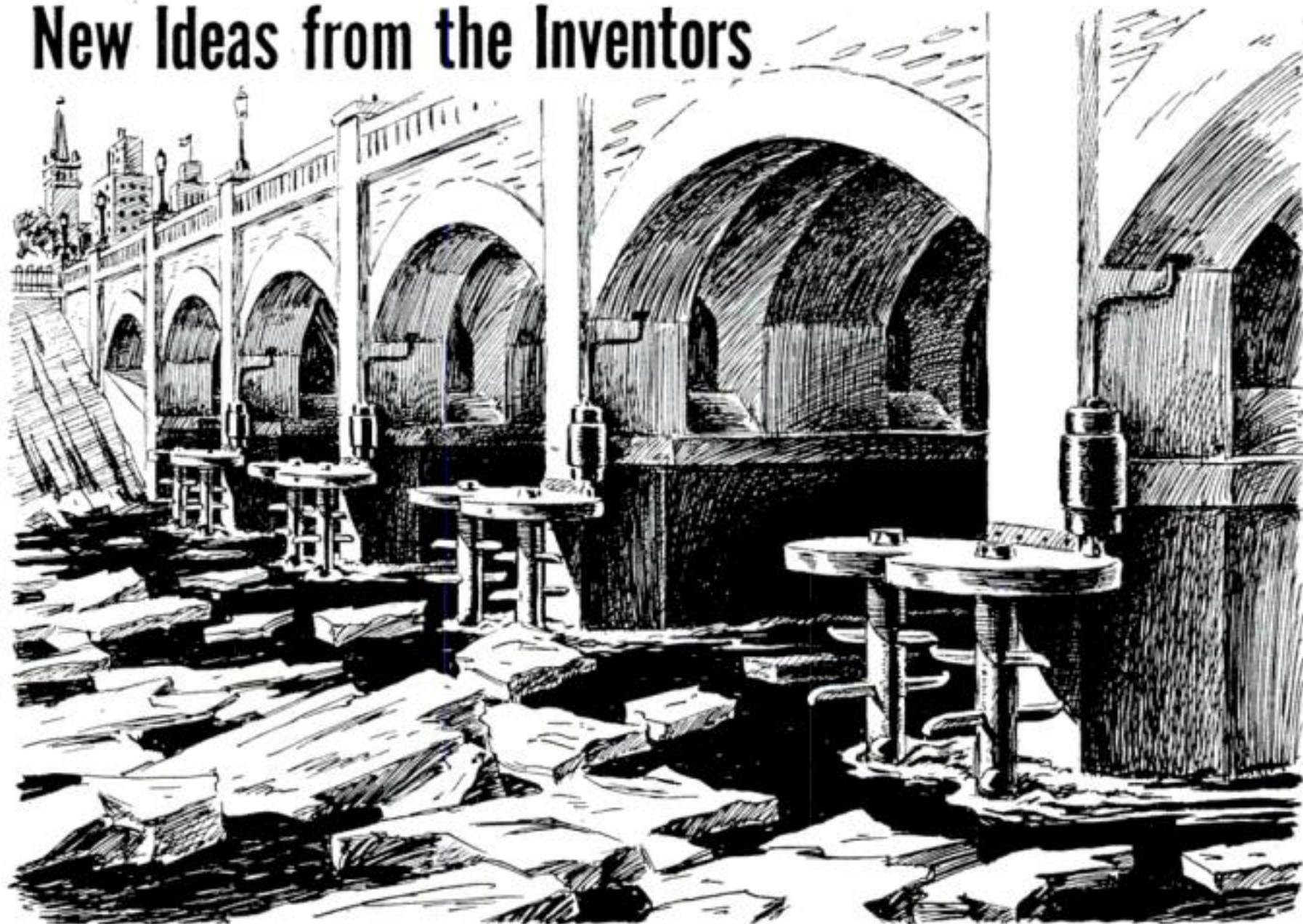


Mighty C&O Allegheny 2-6-6-6 gets its main journal bearings lubricated with movie-projector oil from hypodermic syringe. This was one of last big steam locomotives built by railroads.

are painted backdrop. Multiple-track main line holds five full trains side by side.



New Ideas from the Inventors



1 Ice Breakers to Protect Bridges.

These oversize "meat grinders" would break up ice as fast as it formed around a bridge, preventing large floes from damaging the piers and keeping dangerous jams

from building up. Each grinder consists of two spiked columns rotated in opposite directions by an electric motor. The spikes grind up the ice and push the chunks away from the bridge piers.



2 Trigger to Pump Up Car Jack. Axle jacks with folding, detachable handles often are hard to put into place and to operate. This hydraulic-jack design is intended to eliminate these troubles. It would have a rigid, attached handle terminating in a pistol grip to aid in placing it. Squeezing a trigger pumps up the jack.



3 Turntable Boxcar to Aid Loading. Pivoted at the center, the body of this boxcar could be rotated so that both sides and both ends could be reached from a single loading platform. Doors at each end, as well as at the sides, would permit loading at all four points, speeding packing and simplifying even distribution of cargo.

MORE New Ideas from the Inventors



4 Home on Wheels to Have Garage.

This motor coach fitted out as a rolling home would also house a small car for shopping chores and short side trips. An electric motor, controlled by a key-operated switch,

would open and close a hinged rear door and also lower and raise a ramp. A safety switch, operated by a bumper along the bottom edge of the door, would stop the motor automatically if the door struck anything.



5 Motor to Drive Garden Spade. This design for a motor-driven spade promises to lighten the hard work of gardening. As the wheeled carriage moved along under its own power, a spade blade would be alternately pushed into the dirt ahead and pulled out. On the outward stroke, the spade would turn to throw the dirt to one side.



6 Platform to Speed Plane Servicing. Airplanes could be fueled in half the time it now takes if this mobile fueling unit were used, the inventor claims. His plans call for a counterbalanced fueling arm connected by hose to a central gasoline supply and mounted on a wheeled platform that can be raised hydraulically.

Patents on these inventions have been granted to: 1. J. Musial, Detroit; 2. J. Phanning, Winona, Minn.; 3. F. Holmes, Philadelphia; 4. C. Rice, Daytona Beach, Fla.; 5. J. Bolongaro, Charlbury, England; 6. J. Short, East Orange, N. J.

Portable electric saw at right is probably most common tool in home building today. Homelite generator (below) powers saw and most of other tools used.



Portable Machines Build Houses Fast

You can find power tools for every job, rent them for as long as you want, and learn to use them in a few minutes.

MACHINE-MADE houses are going up all around you. Not stamped out like so many Fords by giant machines on a factory assembly line, as economists predicted. But built on the spot to individual designs by small machines that go anywhere.

This quiet revolution in home construction has been brought about by two types of machines: engines that can produce power wherever it is needed, and portable tools which use that power to build houses faster and better than ever before.

Already the handsaw and the pick and shovel have been practically outmoded by the power saw and the bulldozer. The hammer may be next—a pneumatic nailer can fasten subfloors in seven houses in a day.

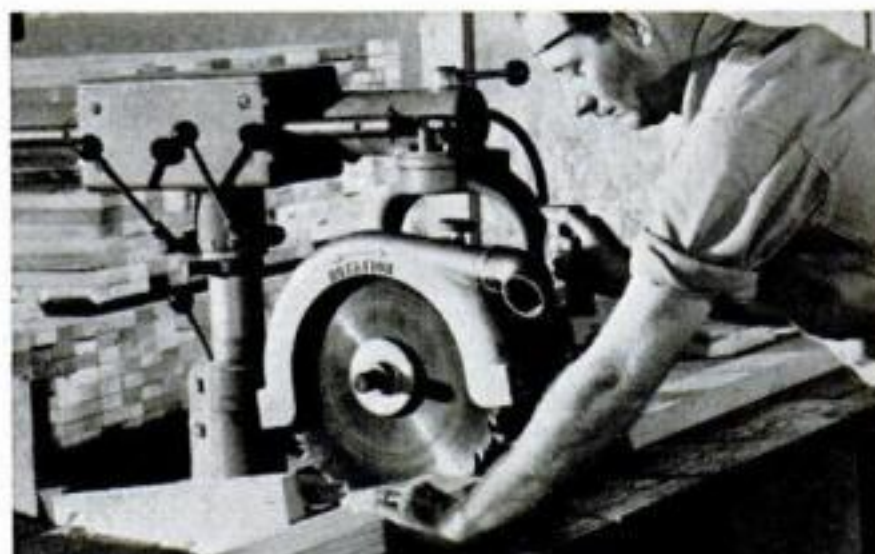
There's a power tool for nearly every building job. One company alone makes 125 different types—plus 40 *categories* of accessories. There's a saw that can cut anything from sheet metal to drain tile. There's a gasoline hammer that can dig postholes through frozen ground. There's a pipe pusher that can ram four-inch water mains straight through the ground—only a short starting trench is needed.

Most of these machines, moreover, are

FROM CLEARING THE SITE UNTIL A HOME IS



Trees are cut by chainsaw, saving time and money over old hand-sawing method.



Lumber is cut to size on site or at lumberyard by powerful radial saw.



Corners of floors are sanded by floor edger, which can get into all the tight places.



Holes big enough for pipes are made straight overhead by electric drill with wood auger.



Subfloors are nailed by Nu-Matic nailer. One man nails 5,000 sq. ft. a day.



Pipe is threaded automatically at home site. Generator provides power.

easy to use. "Given the right instructional material," says one manufacturer, "10 minutes' reading time makes anyone competent."

And the power to run them is available anywhere, no matter how remote the job. In developed areas, it is usually electricity from a temporary outlet that the power company

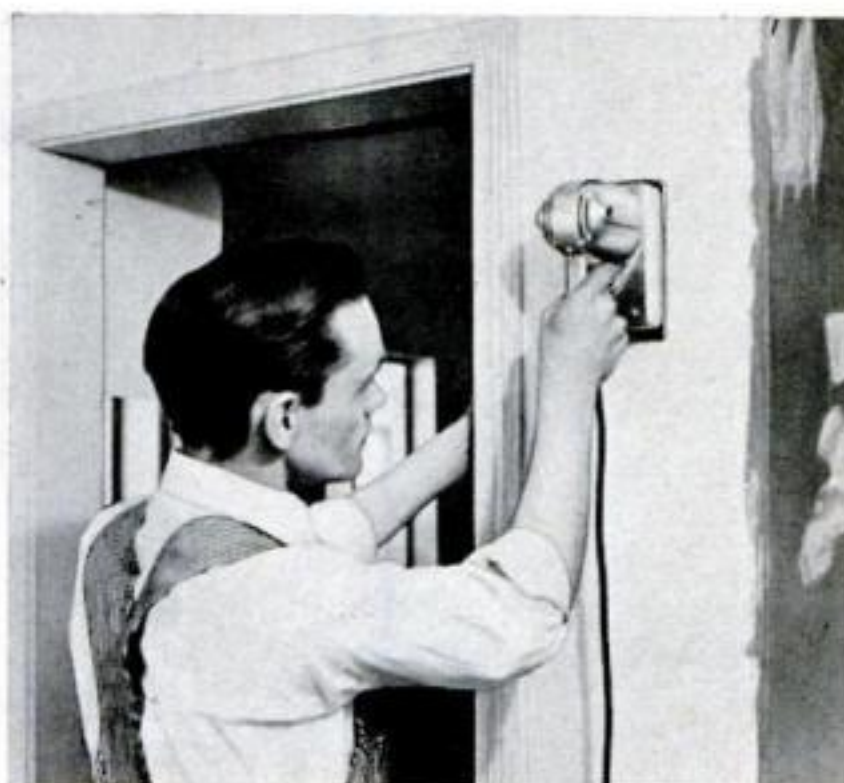
puts up. Or maybe the builder "borrows" from an outlet in a neighbor's house.

But frequently the contractor takes his own power with him. A generator like the one shown on page 135 will provide both high-cycle (230 volts, 180 cycle) AC for high-cycle tools like some chain saws, radial

COMPLETED, POWER TOOLS HAVE JOBS TO DO



Windows are planed down to fit by Mall electric plane. Doors are similarly planed.



Plaster is smoothed by oscillating sander. It also works on curved or overhead surfaces.



Random-length siding is nailed in place, trimmed like this by portable electric saw. So is random roof sheathing or subflooring.



Concrete floor is drilled to anchor furring by Black & Decker electric hammer (3,600 blows a minute). Hammer drills brick walls.

saws, drills and concrete vibrators, and 110-volt DC for night lighting and for other drills, saws and electric hammers.

This generator is air-cooled—it can't freeze up—and it is sealed against rain, snow or dust. It weighs 129 pounds.

From site to roof, portable power is at

work. One contractor keeps four sizes of bulldozers on hand to clear and grade sites. Twelve-inch trees that it would take 12 hours to remove with handsaws are cut in 4½ hours with a chainsaw.

Foundations, footings and trenches for utilities are dug on many jobs by a combina-

SAWS CUT MUCH MORE THAN WOOD

EQUIPPED with proper blade or abrasive disk and water cooling where needed, portable saws cut almost anything—metal, stone, glass, tile, clay products, wallboard. Simple adjustment on most models tilts the blade to cut miters, notches in roof rafters, and other angles. These saws come in range of sizes, and are probably the most widely used of the power building tools.



MARBLE



SEWER PIPE



CONCRETE BLOCK



INSULATION



BRICK

tion trencher and front-end loader, a truck-size digging machine. An electric pump keeps excavations dry, or pumps out holes before concrete is poured. Postholes are dug by a two-man gasoline-driven auger. A one-man gasoline hammer, so powerful it goes through frozen ground, digs holes and trenches, too. Yet it weighs only 100 pounds and fits into the trunk of an automobile.

A powerful pusher shoves pipes straight through the earth so the streets and walks needn't be torn up and traffic is not disrupted. It handles gas, water or sewer pipe from 1½ inches to four inches in diameter. It does this with hydraulic pressures of 6,500 to 40,000 pounds.

Concrete for foundations, floors, drive-

ways, steps and walks is trucked to housing sites ready-mixed in revolving drums to keep the concrete from hardening en route. After the concrete has been poured into place, it may be vibrated—to make it denser, stronger and more waterproof—either by concrete vibrators or by electric hammers. Some contractors use a Syntron vibrator to strengthen load-bearing edges of their floor slabs.

When it comes to cutting the frame, a radial saw can handle the whole job. Joists, studs, beams and rafters may be cut on the site or in a shop by a 16-inch radial saw. Versatile, tough, accurate, powerful (three to five horsepower), it can cut through eight two-inch pieces at the same time.

Stair stringers, corner bracing, and rafters

are notched by the radial or the portable electric saw.

As a house goes up nowadays, you may seldom see a carpenter without his power-operated right arm, the one with the whirling, whining saw blade. The portable electric saw is just about the handiest of the power tools—on many home-building jobs each carpenter is allotted one. Like a handsaw, it is easily carried wherever there is something to cut. But unlike a handsaw, it changes blades to suit the job, and it gnaws right into paneling or subflooring without a starting hole.

The portable saw is fast. In one test it ripped through 10 feet of 1¼-inch fir in 30 seconds. A man with a handsaw cut only one foot in the same time.

And it is light enough so that overhead cuts and day-long sawing don't call for a steelworker's physique. The smallest saw (six-inch) weighs only 9½ pounds, the popular eight-inch model around 20. A new 8¼-inch is so powerful it slices through the heaviest loads without slowing up.

One of the most unusual of the new tools is the automatic hammer. This is a pneumatic device that can drive 100 nails a minute into subflooring or roof sheathing. The carpenter just stands on the board, raises the handle, presses the trigger—and goes on to the next board.

Through the growing house, other tools speed the work. For bending pipe—a big job when radiant heating is going in—you

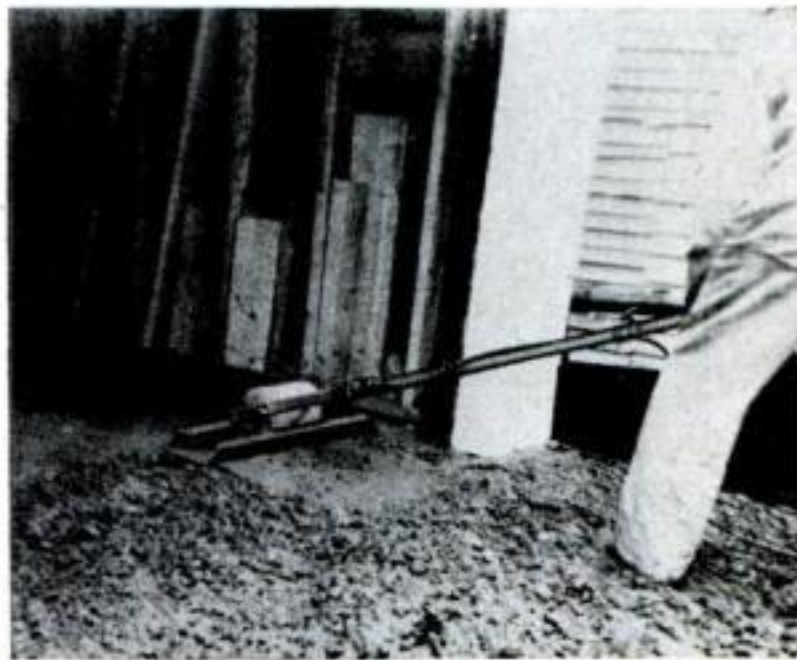
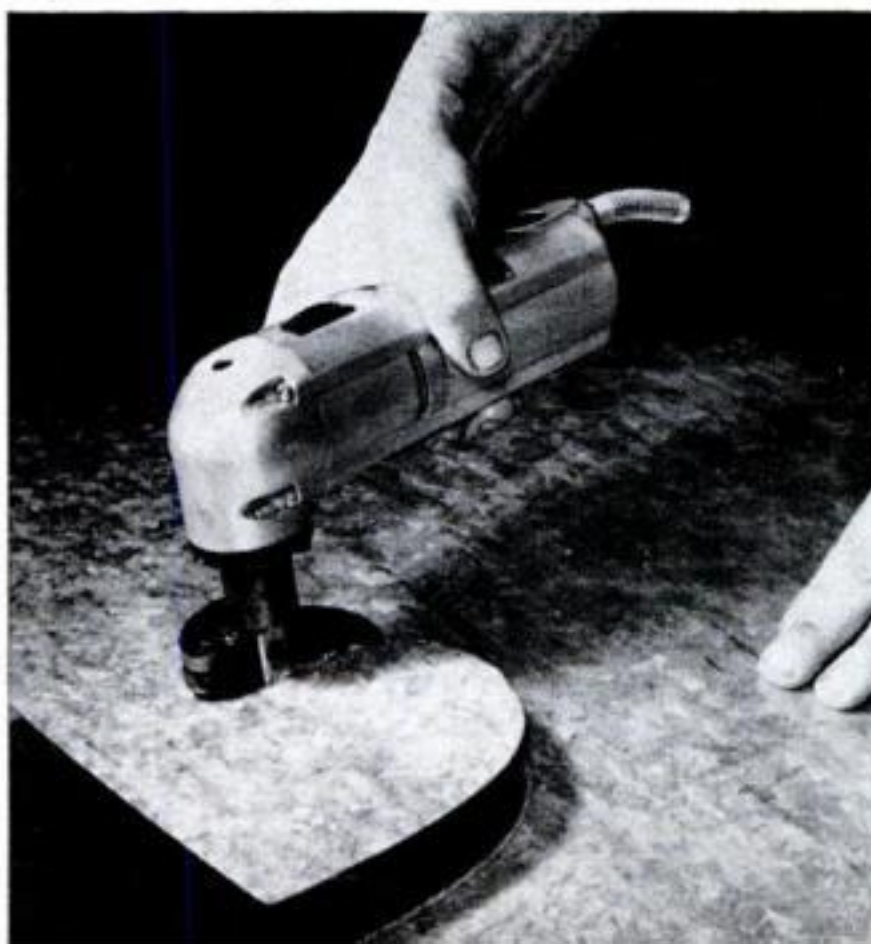
[Continued on page 248]

THESE TOOLS ARE BECOMING MORE COMMON



Pipe bender shapes cold pipe. By pumping handle, a man can develop hydraulic power to make bends. Or motor can power bender.

Electric shear cuts sheet metals—aluminum, copper, steel. It cuts gutterwork (here), flashing and heating ducts.



Vibrating float surfaces concrete five times as fast as by hand, makes load-bearing edges of house slab stronger.

Power hammer digs postholes, breaks rock, digs clay and shale and tamps back-fill. It is driven by gasoline motor.

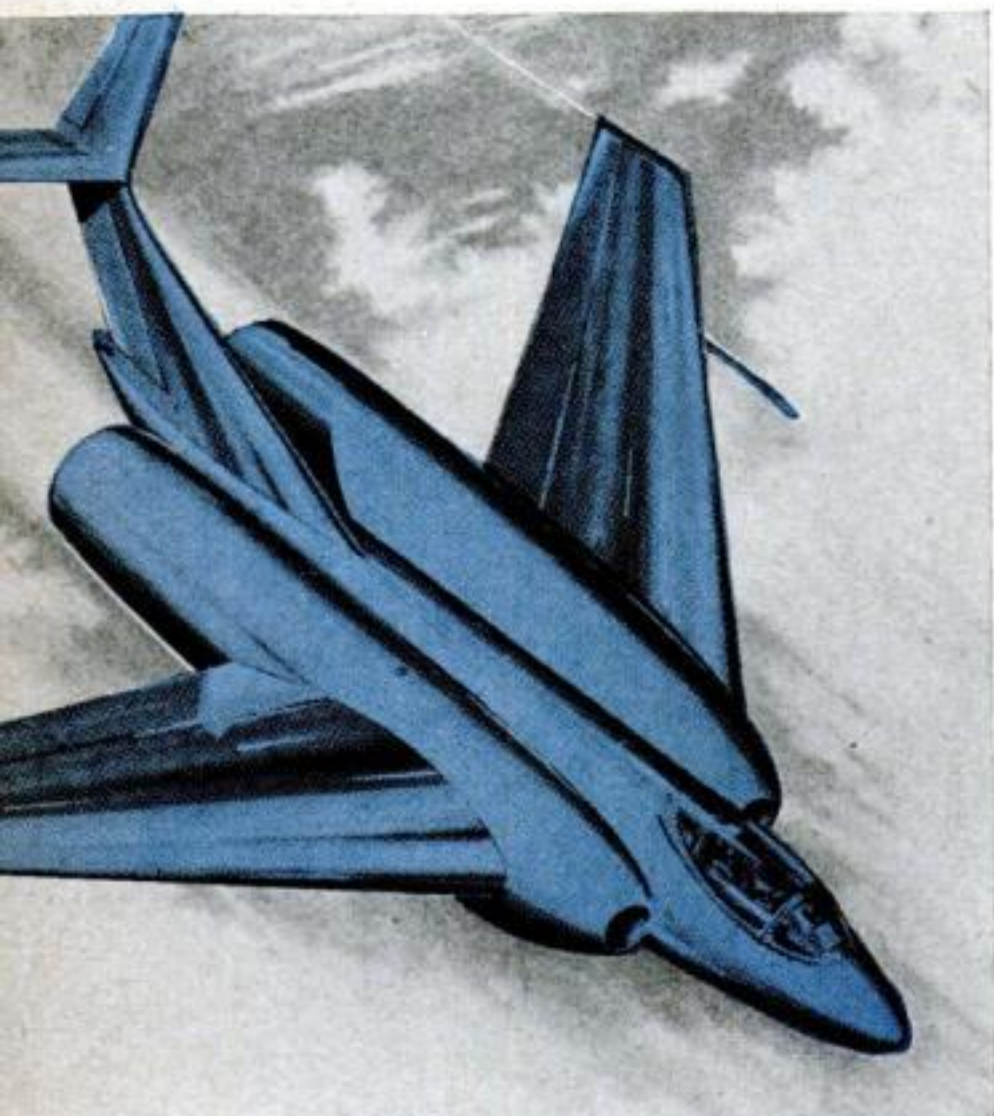


Is Russia Building These Speedsters?

By Chalmers ("Slick") Goodlin

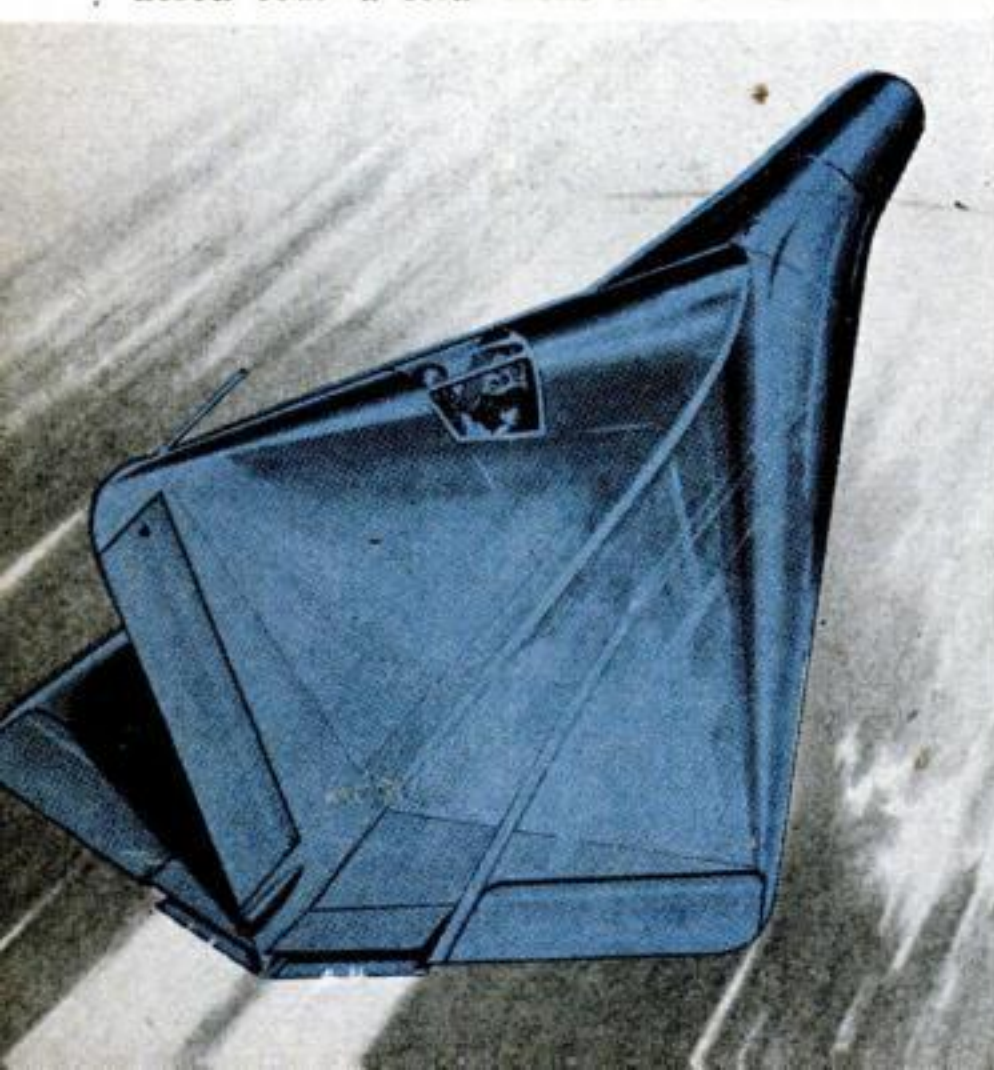
AT THE end of World War II, the Russians rounded up some 80 percent of the Nazi aircraft industry and moved its brains, experience and factories behind the Iron Curtain. A juicy prize, for it is well known that the Germans had designs for jets and rockets far in advance of any U.S. development at the time.

"Has the Soviet exploited this advantage?" I asked a private source in Europe that has proved reliable in the past. In reply, I received these three drawings, published here for the first time, of planes designed for *sustained* supersonic flight.



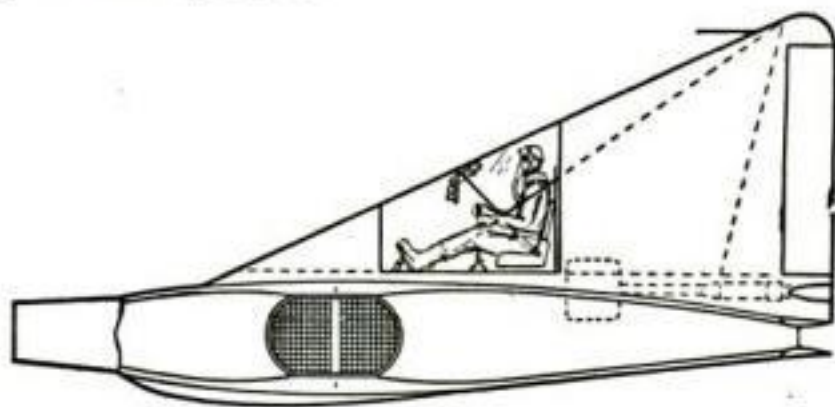
The Russians may have added a T-tail to the Heinkel P-1080. In the design shown above, the twin ramjet engines, about 16 feet long and three feet in diameter at the combustion chamber, are bigger than the fuselage. And the entire fuselage, behind the nose-tip cockpit, is prob-

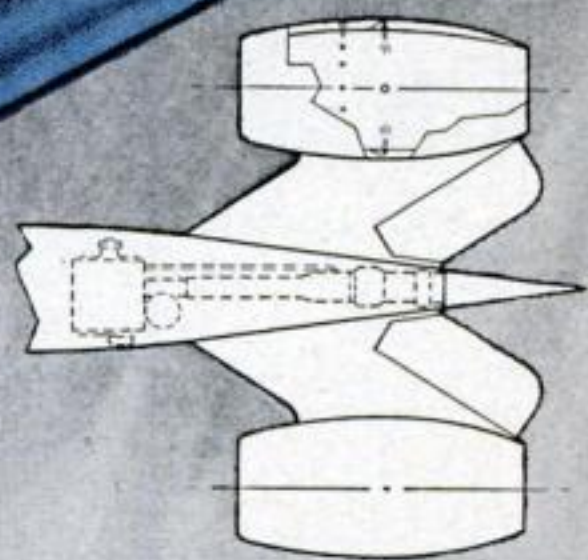
A flying wedge like one below is reported to be on the Russian drawing boards. As radical as its design is the ramjet power plant—reportedly able to push the wedge to double the speed of sound. Indications are that it can burn powdered *coal*—a steal from the oil-starved Luft-



ably a huge fuel tank. Although no rocket-assisted take-off device is evident, some RATO scheme must be provided for ramjets. Retractable landing skids may be another feature. Progress on this design is not known, but considerable work is reported.

waffe. The cockpit shown is a 65-degree-sweep fin. Wing has a 60-degree sweep, with a split jet exhaust in the tail. It is believed the Soviet has a 6,600-pound-thrust rocket that can get the plane to the speed at which its ramjet engine will operate.





Engines in the tail are a futuristic feature reported in this possible Soviet development of Kurt Tank's Ta-283 Focke-Wulf design. From information available to him, the artist has drawn details of tail-mounted ramjets with a rocket engine in the fuselage. With a wing sweep of 45 degrees, this design is rumored to have a span of about 26 feet and length of almost 39 feet. Fuel tanks are just forward and aft of cockpit, which fairs into tail fin. Rocket engine could be used for take-off, for acceleration to ramjet speed and for bursts of combat speed.

Aids to Modern Living

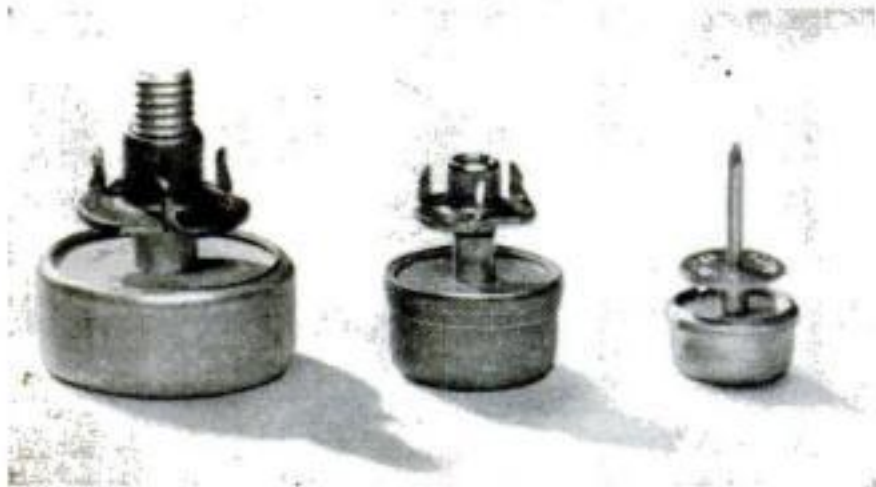
Traveling Crib. Baby takes a safe nap in train, plane or car on this inflatable cushion. Air-bolstered sides keep the baby from rolling off and retainer straps add extra security when needed. It will also hold him in place while he wriggles through his sponge bath. *Kaydon Mfg. Co., Santa Monica, Calif.*



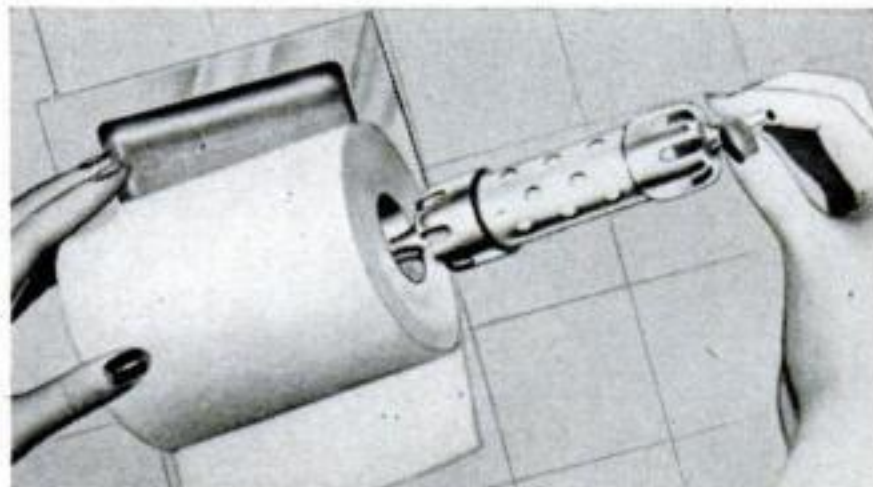
Gas Stove Has Electric Pilot. There's no gas pilot light on this Norge stove. An electric glow coil does the igniting. You simply press a button and then turn on the gas. There's also an oven-lighting coil.



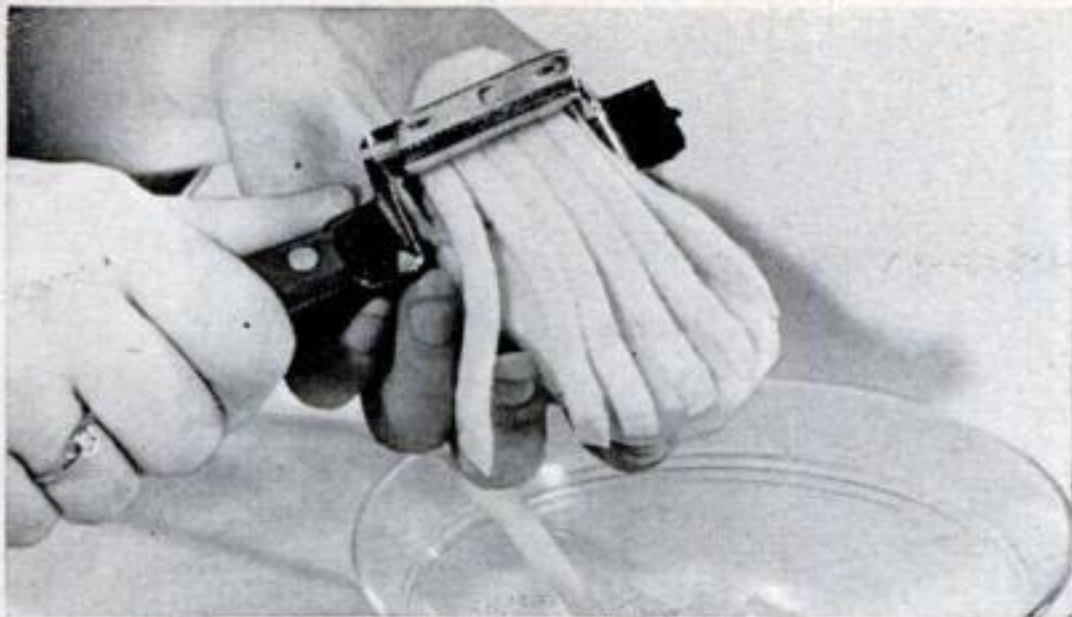
Six Measures in One. Adjusting the lever on the handle moves the bottom of this plastic cup up or down to change its capacity. Settings range from a whole cup to quarter-cup. *Miles Kimball Co., Oshkosh, Wis.*



Automatic Furniture Levelers. Filled with silicone compound, these glides for furniture legs adjust themselves hydrostatically to compensate for uneven floors. *M. K. Furman Co., New York City*



Air Freshener. This deodorizer hides away inside the toilet tissue in place of the usual roller. The chromium-plated dispenser contains a replaceable chlorophyll cartridge. *Walter Thomas, Los Angeles.*



Shoestring-Potato Cutter. Fit a paring knife into this tool, crosswise to the six little built-in blades, and it will cut the potato into narrow strips. *Art Metal Appliance Co., Hollywood, Calif.*



Refreshment Server. If a snack plate and coaster are combined this way, you can reach for the hors d'oeuvres and the glass won't skid off your plate into your lap. *Alexander & Wilson Co., Pasadena, Calif.*



Wallpapering Machine. With this equipment you can trim and paste wallpaper in one operation. Paper roll is inserted on



spindle, and fed through cutters and past pasting roller. Plumb line sets length. *Hyde Mfg. Co., Southbridge, Mass. \$55.*

Ottoman-Chair for TV. Lift and fold back the top of the ottoman below and it becomes a chair. As the top is raised, the rear legs

disappear into the frame, tilting the chair for comfortable televising. *Holland House Mfg. Co., Chicago.*



MORE Aids to Modern Living



Hot Picture. An invisible electric heating element built into the surface of this picture makes it a small room heater. Maximum temperature of the surface is under 200°F. *Electrofilm Corp., N. Hollywood, Calif.*



Venetian-Blind Control. Fasten two self-locking clips to the tapes and cords and you can close your blinds at the bottom and keep them open at the top. They work in reverse also. *Kuto Co., New Hyde Park, N. Y.*



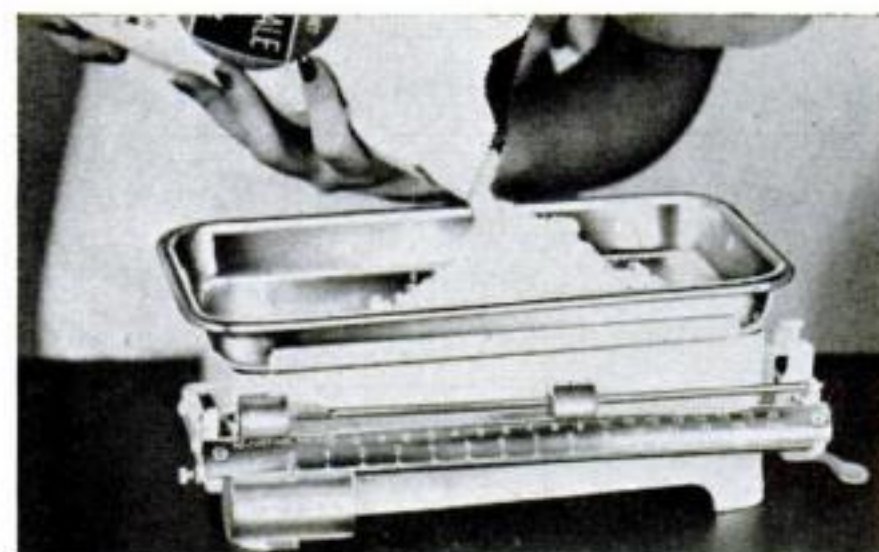
Luminous Dial. The two plastic halves of this glowing dial face lock in place on telephone and give sufficient illumination for dialing in the dark. *The Glo-Dile Co., Burbank, Calif.*



Painless Tweezers. Eyebrow-plucking is hardly felt with these tweezers. Pressing the sidepieces snaps blades back into a sleeve, so that hair is grasped and drawn out in one operation. *D. Corrado, Inc., Chicago.*



Paper Container Is Rugged. This plastic-coated container will store any food, even hot bacon fat, without leakage or absorption. It's for use in refrigerator or freezer. *Sealright Co., Inc., Fulton, N. Y.*



Kitchen Scale. A range of ¼ oz. to 14 lb. is covered by this springless scale and its balance weights. The imported \$16.95 scale is finished in enamel, has a removable chrome tray. *Hoffritz, New York City.*



He Shoots Houses Out of a Gun

This nozzleman can build the walls and roof of a two-bedroom house in a working week, shooting cement and water against steel forms.

THE man looming above is spraying a mixture of sand, cement and water under 40 pounds' pressure. He is building a house that when finished will look like the house of Mrs. Pauline Vogel, of Apple Valley Vista, Calif., shown in the inset above.

A man with a gun shot Mrs. Vogel's house in 40 working hours: the whole job took five weeks. And it cost about \$8.50 a square foot, considerably less than conventional wood construction. The only parts of the struc-

ture made of wood are doors and cupboards.

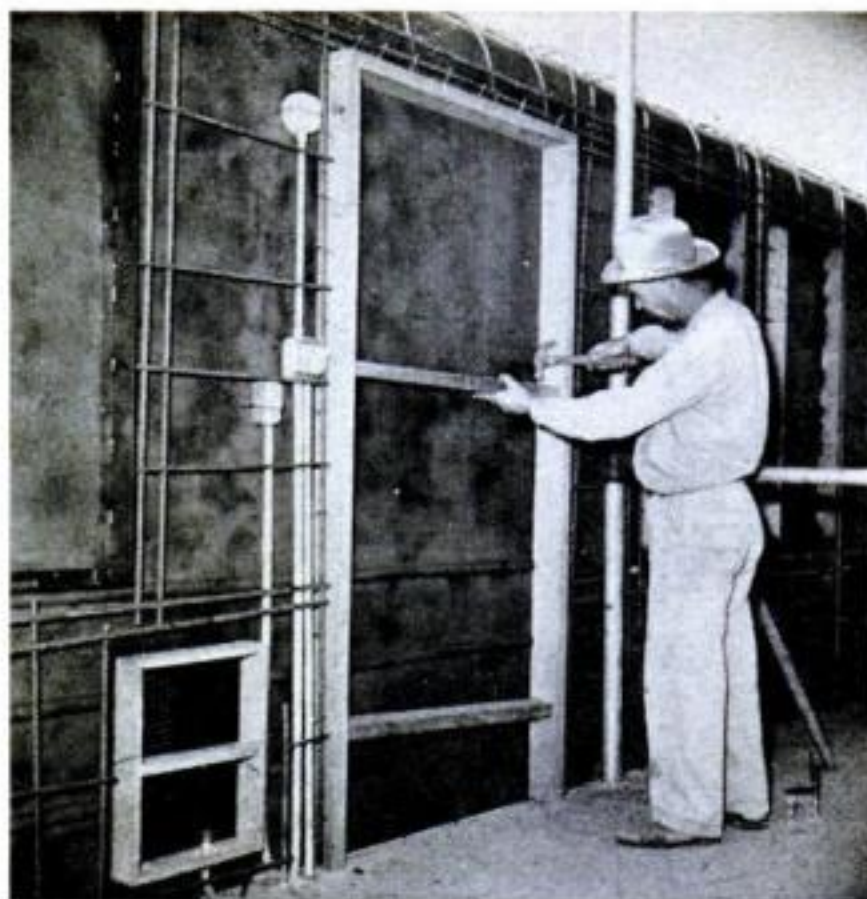
It takes a bag of tricks to put up long-lasting houses at that price. First, steel forms with a single "backdrop" wall are erected in sections on a regular concrete foundation and floor slab. These forms outline the outside of the house. A network of steel reinforcing bars is tied together along the inner side of the form. Plumbing and electrical conduits are tied into the bars.

The mix—cement and sand—is blown dry

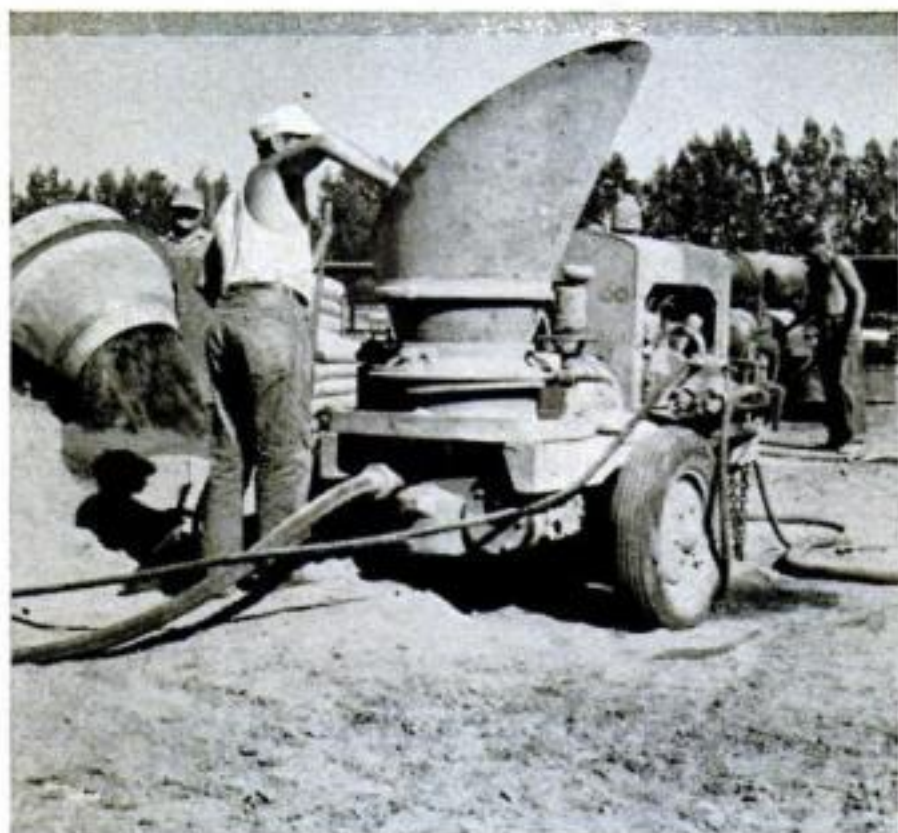
through a pipe to the nozzle, where the nozzleman controls its mixture with water fed through a hose. When the pressure climbs to 40 pounds, the nozzleman starts shooting cement against the open, inner face of the form. Reinforcement, pipes and conduits are all engulfed as he builds up a vertical six-inch layer of concrete—the wall.

The walls separating the rooms are half as thick and made in the same way, while the roof is blown on from above against steel forms. The forms are pulled out after two or three days when the concrete has set hard. The exterior walls are then waterproofed.

The homes shot out of a gun are being developed by Conair Sales, Inc., of North Hollywood, Calif. The sectional steel arch and wall forms were perfected by William Bobisch, veteran structural engineer, and L. E. Town, a professional builder. They say their houses are insectproof, fireproof and virtually earthquake-proof. **END**



Frame outlining door is placed against metal wall form: nozzleman will shoot around it. Steel-bar reinforcement, electric conduits, pipes, are in place, will be embedded in wall.



Cement-sand mixture, being dumped on ground by mixer in background, is shoveled into screened hopper. Air compressor will blow it through pipe, foreground, to nozzle.

Dome-shaped roof form is put together from numbered steel panels that are supported on steel poles, like one in foreground. Forms will be removed after cement hardens.



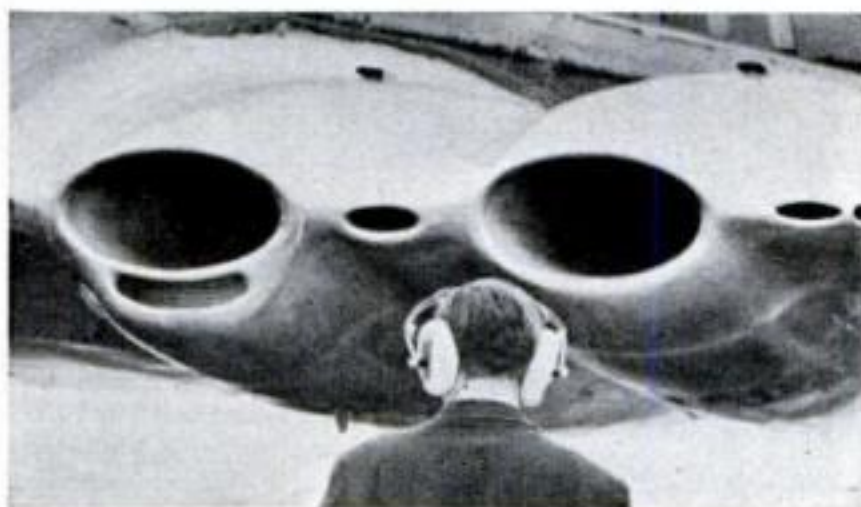
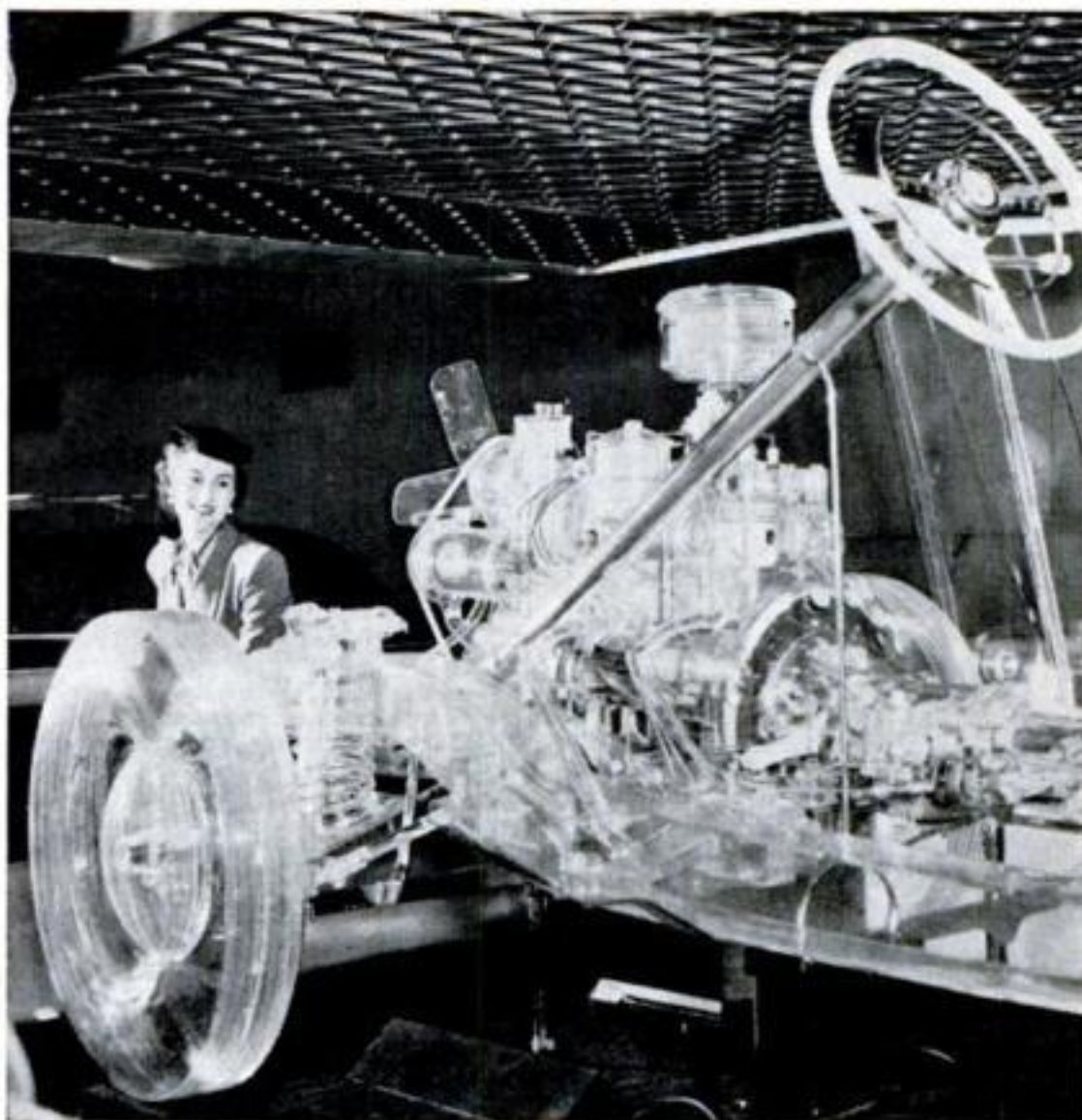
Nozzleman sprays inside wall form in horizontal strips, starting at the floor. Dry mix arrives in large pipe, water in hose. Ingredients are combined in nozzle into stiff mixture to avoid sagging.

Nozzleman shoots the roof from above while helper handles mixture and water lines. Later two coats of rubber-base sealer, the last one colored, will be sprayed on.



You Can See Through This Plastic Car

THIS full-scale model of a Plymouth, with engine, chassis and wheels of transparent plastic tells the inside story of how an automobile functions. Its largest unit, the engine, has a cylinder block machined from a chunk of plastic 12 by 12 by 24 inches. And it works—by means of a chain drive from a concealed electric motor. Parts of the power train are colored distinctively to help spectators follow the flow of power from combustion chambers to wheels as the engine turns over at a lazy six r.p.m. Some 1,200 separate plastic parts had to be made for the display model. Building it took a year and a half.



Ear Muffs Deadend Jet Roar

EAR muffs—for quiet, not warmth—may become a common sight at airports when roaring jet liners go into commercial service. A British ground crewman models a pair at left as he faces the jet air intakes of a de Havilland Comet (it's okay, the engines are off). This plane is expected to begin regular flights on the London-Cairo route soon.

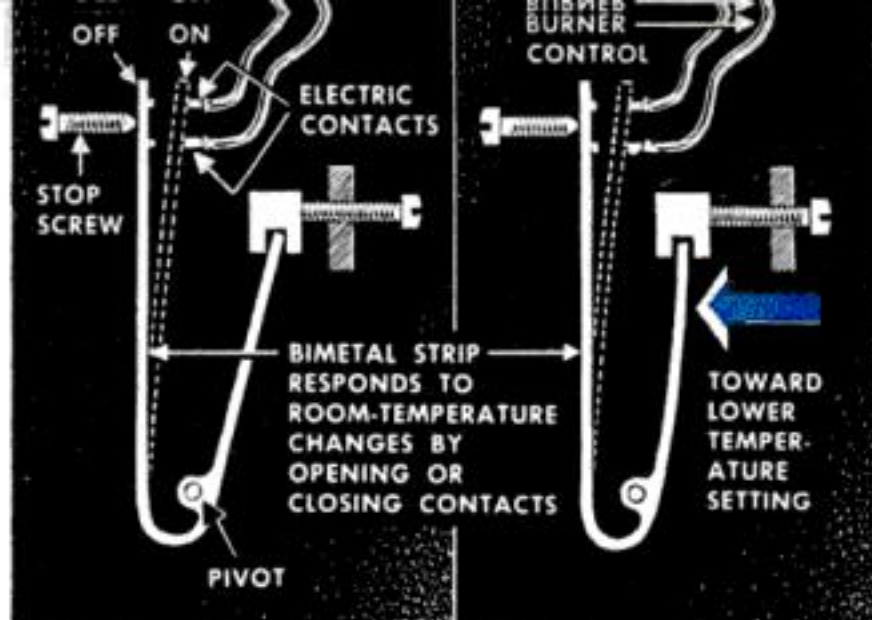
Caged Tractor Protects Golf-Ball Retriever

SAFE inside a wire cage, this man sweeps up golf balls on a practice-driving range the easy way. He tows a machine, shown in closer view at right below, that can gather up to 1,200 balls in 15 minutes. The balls are squeezed between a series of rotating fiber disks, stripped loose by mechanical fingers and deposited in catch

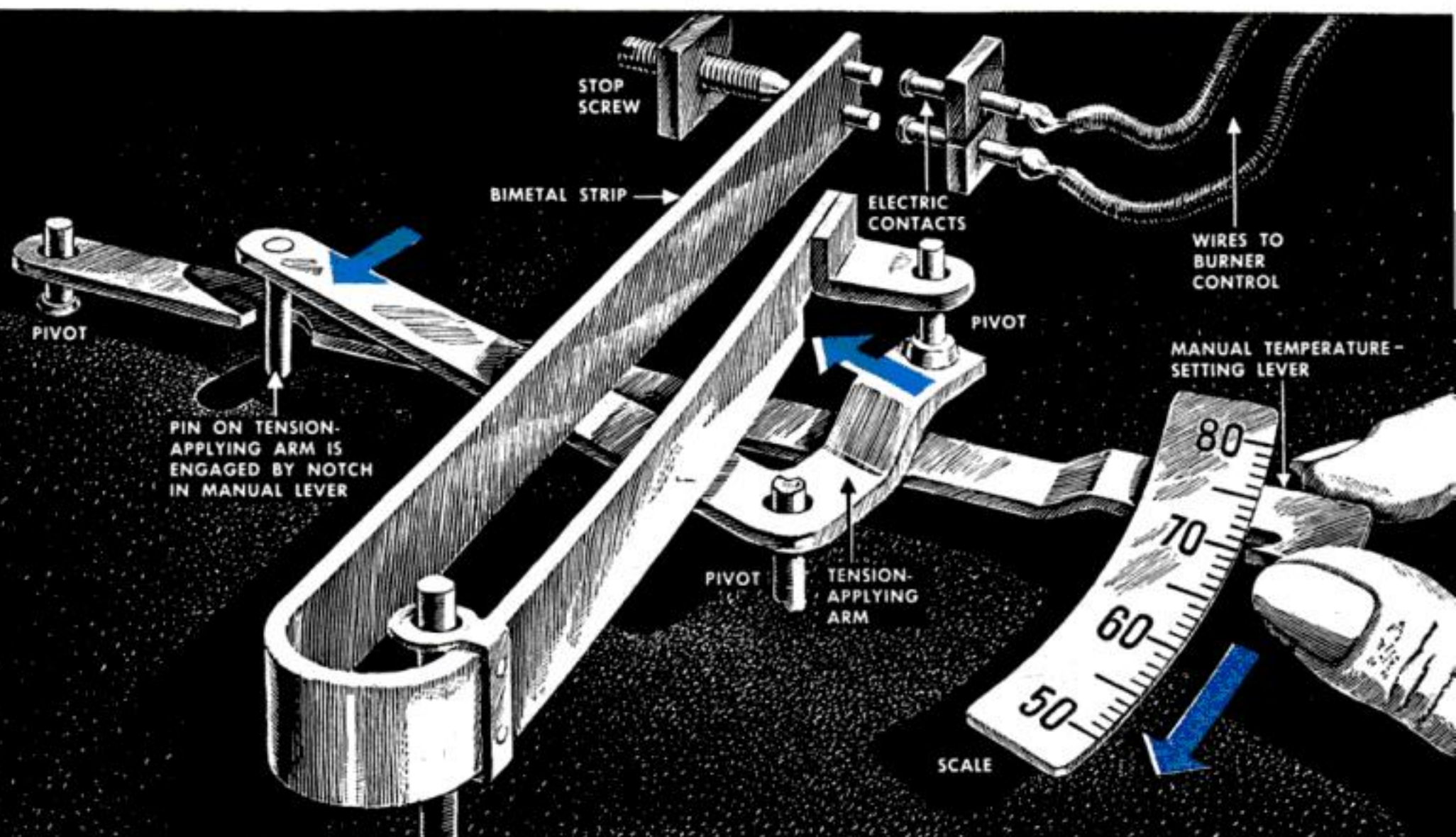
bins. Felix Kropp had the machine designed so that he wouldn't have to shut down his driving range in Madison, Wis., every time balls have to be picked up. It sweeps up more than 90 percent of the balls it passes over. When the small tractor is not busy at its ball-retrieving job, it pulls a lawn mower.



How a Thermostat Tends Your Furnace



Here is thermostat's principle. U-shaped, bi-metal sensitive element turns heat on as room cools; off as room warms. Adjusting tension (right) sets it to maintain temperature wanted.



Room thermostat applies principle shown at top of page, using a little more elaborate mechanism. Here's how a hand lever adjusts the sensitive element to maintain desired room tempera-

ture. In manual operation, lever is pushed down at night and raised in the morning. In clock thermostat (facing page), this lever remains at daytime setting, and automatic timer does rest.

By Alden P. Armagnac

EARLY on a chilly morning while you sleep, a benevolent genie called a clock thermostat snaps a basement switch and turns on the heat. By the time your alarm clock goes off and you yawn and stretch, the house is comfortably warm.

This is the story of how the clock thermostat works its pleasant magic.

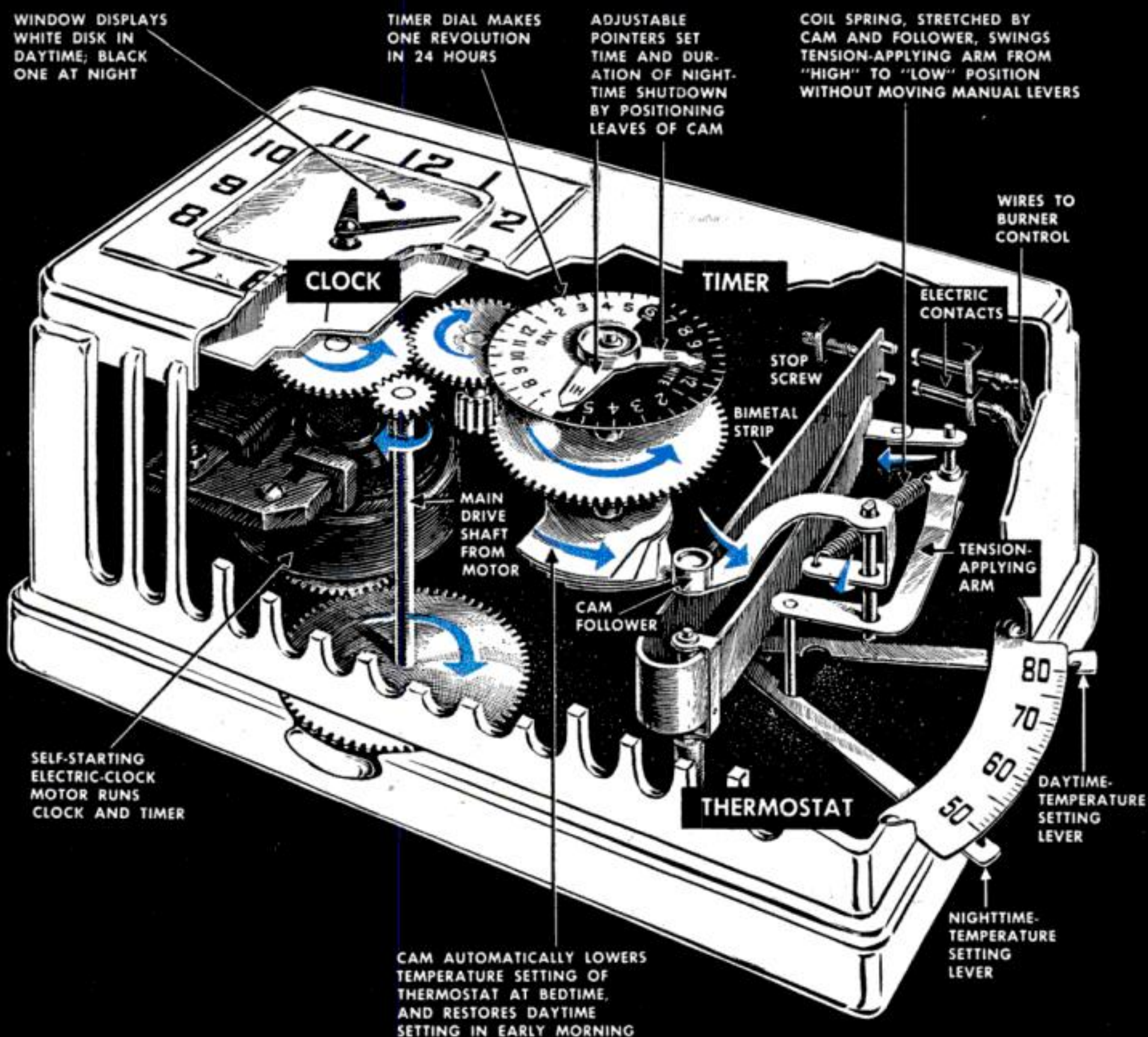
The little brass case on your living-room wall displays a clock dial and a miniature thermometer. The thermometer is there sim-

ply for your information, and has no connection whatever with the mechanism.

Controls of Clock Thermostat

On the outside of a typical model, other gadgets include a temperature scale and a pair of adjustable levers—two of the instrument's four preset controls. The upper lever is set to the desired daytime temperature, and the lower one to the lower temperature wanted at night.

Removing the cover reveals the two remaining controls—a pair of adjustable point-



Clock thermostat automatically lowers temperature at night and raises it in morning. Simplified drawing shows how cam adjusts sensitive element directly. Two manual levers stay put.

ers, marked "Hi" and "Lo," on a black-and-white 24-hour dial. The "Hi" pointer is set to the hour at which you want heat to come on in the morning, the "Lo" pointer to the hour at which you want the temperature lowered at night.

The works has just three essential parts: a thermostat to control the burner, a timer to vary the thermostat setting, and a clock to drive the timer.

Heart of the thermostat is a temperature-sensitive element, a U-shaped strip made by joining layers of two different metals. Heat

Upper one, preset to desired daytime temperature, works as shown on opposite page. Lower one, preset for nighttime temperature, acts simply as a stop to limit temperature drop.

expands the two metals at different rates. Consequently the U-shaped strip uncurls as temperature rises, and curls up again as temperature falls. Since it is pivoted, and one end is anchored, only the free end moves.

When room temperature begins to fall, the sensitive strip's free end moves until it hits a pair of contacts and closes an electric circuit. Through wires leading to the basement, the closed circuit turns on the heat by actuating your oil burner or gas burner.

When sufficient heat has come up and room temperature is about to exceed the

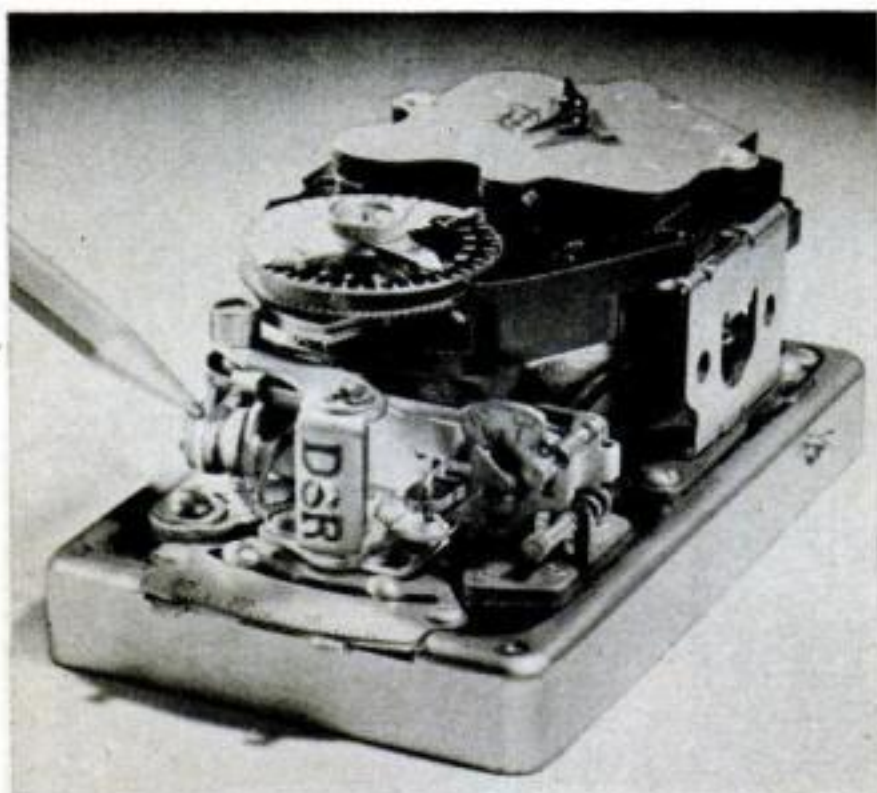


Photo shows actual appearance of mechanism in TM Comfort Chronotherm, a modern clock thermostat, with cover removed. Pencil points to electric heating element described in text.

desired point, the sensitive strip draws away from the contacts, opening the electric circuit and shutting off the burner.

In this fashion a modern thermostat will maintain a room temperature that fluctuates only a degree or two—an imperceptible amount—from its setting.

To make the temperature setting, tension of the springy U-shaped strip is varied by either of two means of adjustment. It may be done manually with a lever or automatically by a clock thermostat's timer.

The Clock and Timer

The timer is a rotating assembly mounted on a single shaft. Driven by a self-starting electric clock through a train of gears, it makes one complete revolution every 24 hours. At its top is the black-and-white time dial, with black marking nighttime hours and white, daytime ones. At its lower end is a cam, of thin multiple leaves that may be spread like a fan. When the "Hi" and "Lo" pointers are adjusted, they set the cam's position and the spread of its leaves.

At the hour chosen for the nighttime shutdown, the revolving cam engages a roller on a cam-following lever, and stretches a coil spring. The spring, in turn, swings an arm that applies tension to the sensitive thermostat element and lowers its temperature setting. The result is the same as if you pushed down the daytime-temperature setting lever.

When the hour chosen for the end of the shutdown period arrives, the cam releases the spring and the tension-applying arm.

This restores the thermostat element to its daytime setting, just as if the manual lever had been moved up again.

Actually the timer does not move the manual levers. The upper lever provides a permanent setting for daytime temperature. The lower one acts simply as a mechanical stop, to limit the lowering of this setting at night. If you're having a late party, push the nighttime lever up to the daytime one; heat stays on, until guests have gone and you restore the usual setting.

For simplicity, this brief description and the explanatory drawings accompanying it have skipped important refinements, built into such modern clock thermostats as Minneapolis-Honeywell's TM Comfort Chronotherm, which is shown in the illustrations.

New Thermostats Look Ahead

Chief of these is a thermostat with the uncanny ability to sense, not only what the room temperature actually is at the moment, but what it will be a little while later! Because of this prophetic power, it can maintain an even temperature with precision.

With earlier and simpler thermostats, houses often got too warm, then too cool. As room temperature drops, such a thermostat will faithfully call for heat—but there's an inevitable lag before heat comes up, and meanwhile the room may become uncomfortably chilly. When the room does warm up and reach the desired temperature, the thermostat will obediently shut off the burner—but it can't turn off heat still coming up the pipes, and some overheating is bound to result.

The modern remedy has been to build a small electric heating element into the thermostat itself. In the model described here, this heating element is attached directly to the sensitive U-shaped bimetal element. It is so connected that current flows through it while the thermostat contacts are closed, and stops flowing as they open.

Extra heat from the heating element slightly advances the time at which rising room temperature "satisfies" the thermostat. Its contacts open, averting overheating. In a short time, absence of heat from the auxiliary element renders the thermostat "unsatisfied" again and its contacts close, restarting the heating plant in time to avoid underheating. Short and frequent burner operation results, favoring even distribution of heat through a room's air and avoiding hot and cold layers.

END

Keeping the Home Shipshape



When machine-sewing on a slick-finished material that keeps sliding, put a rubber drainboard mat on the sewing-machine extension board. It will provide a nonskid surface.



Scratches and scuffs on hardwood floors can be temporarily concealed with shoe polish or with a wax crayon of suitable shade. Blend it in well with the surrounding wood.

Please turn the page for five more suggestions.



Burn old flashlight batteries in the fireplace now and then. The burning zinc may help prevent soot formation, and the metals and chemicals make colorful flames.



Extra-large sheets of wax paper for carrying cakes and pies to a family Thanksgiving are easily made. Overlap regular sheets and join by pressing the seams with a hot iron.



If vacuum-bottle corks harden and shrink from age, they can be given new life and made to fit again by boiling them a short time in a covered pan. This expands the cork.

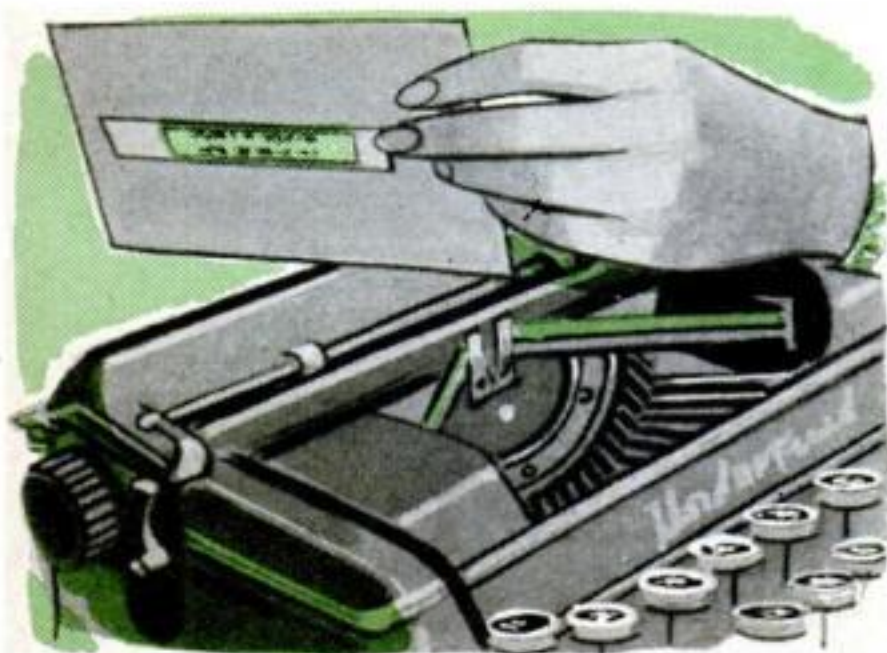
Keeping the Home Shipshape



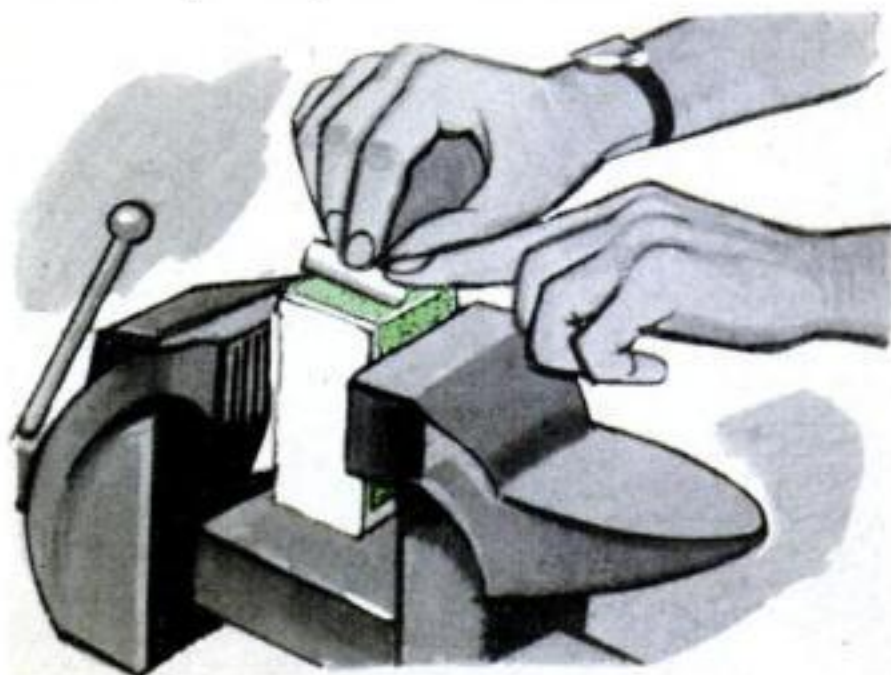
A hot dinner can be kept warm for a late-comer if you cover it with an upside-down pie tin. A pot-lid handle screwed to the center of the tin makes it easier to lift.



An oven gets crowded if four or five pies are being baked at once. Put metal cups on the shelves and set some pies on them. More pies will fit in, saving fuel and time.



Clean typewriter type this easy way. Cut a slot in a card and cover it with cellulose tape. Insert card in typewriter, sticky side out. Type alphabet over with ribbon out of way.

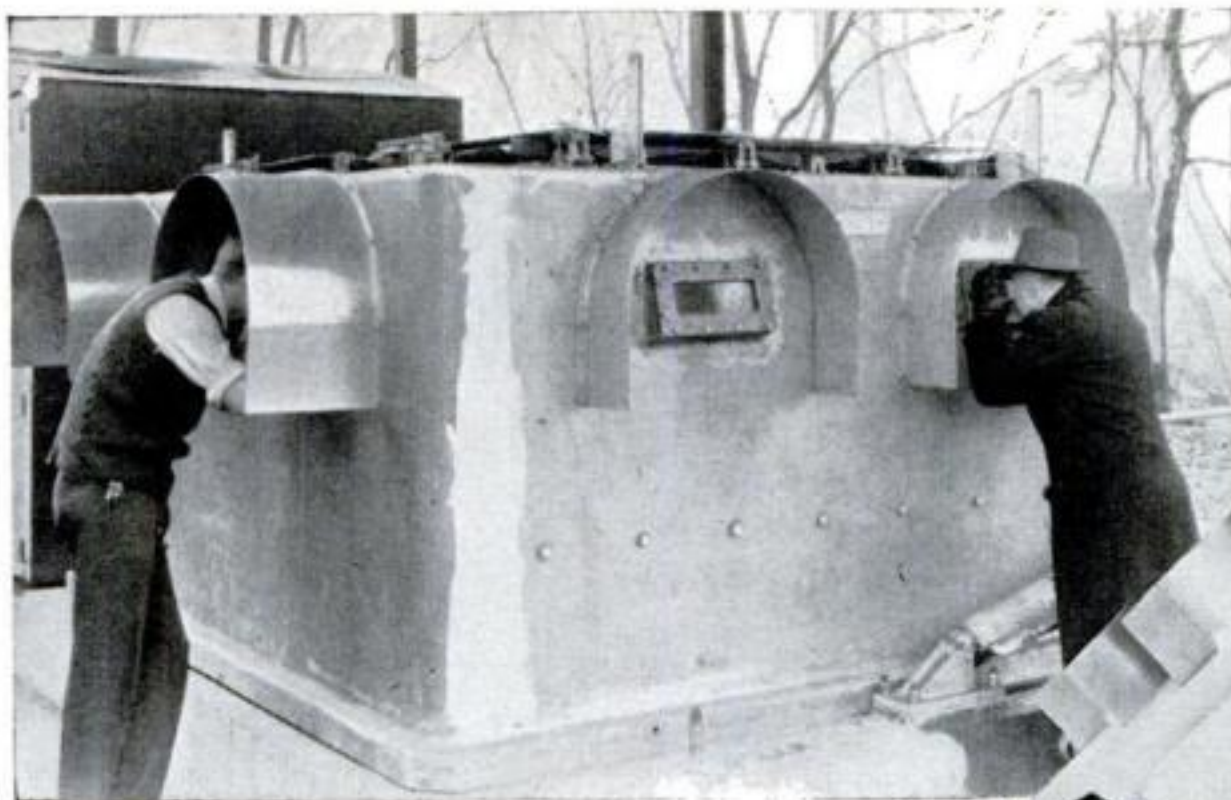


Sanding very small work is a problem if it can't be clamped in a vise or is hard to hold in one hand. Wrap the sandpaper over a block and clamp it in the vise instead.



Modernize an old bed by sawing off the headboard as low as possible. Use the foot-

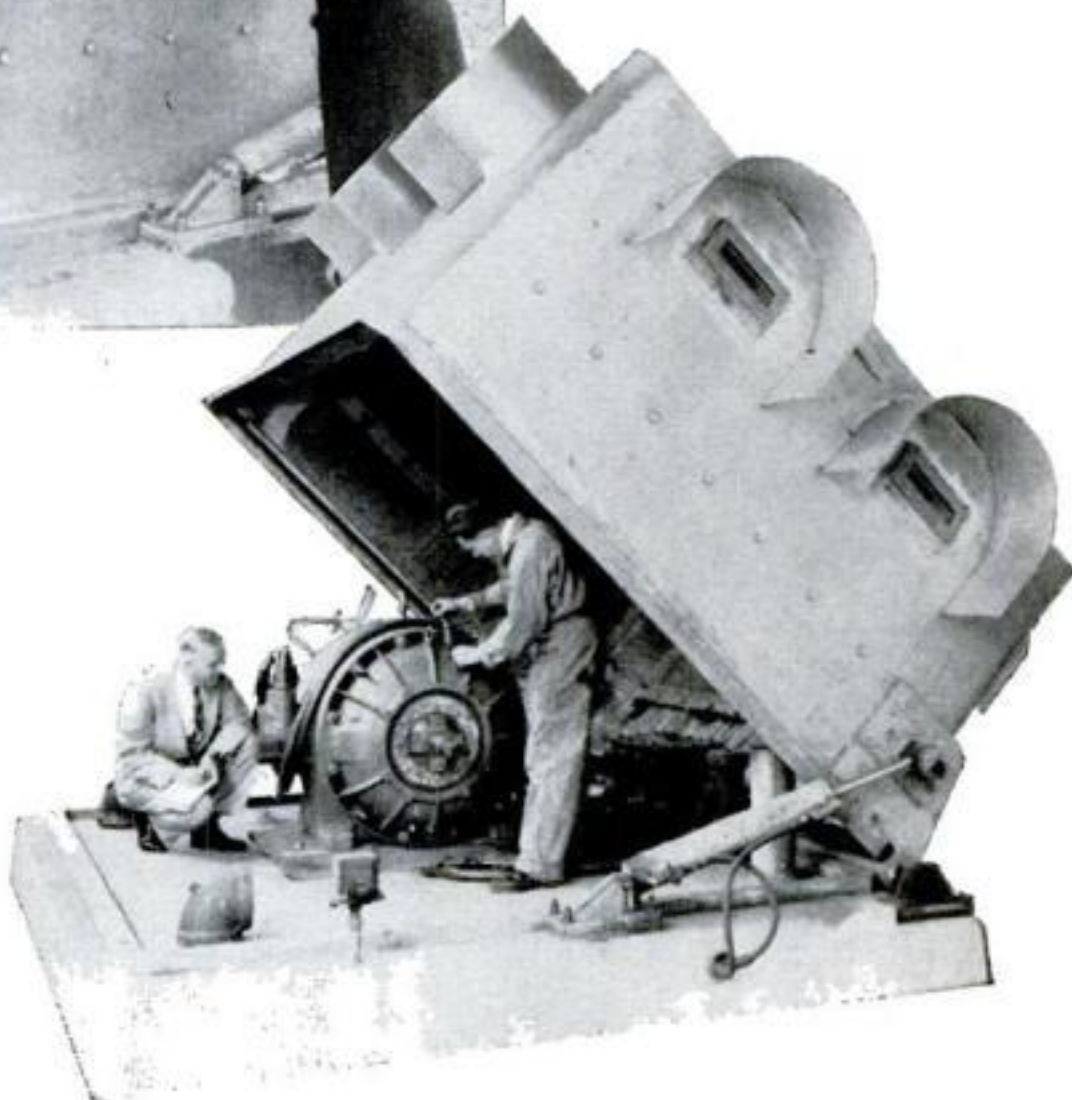
board as the new headboard and upholster with a quilted fabric or plastic.



Peering through shatter-proof glass windows, engineers of the U. S. Bureau of Mines watch to see if an exploding gas-air mixture inside a piece of electrical equipment will set off the rest of the inflammable vapor surrounding the equipment in the test chamber.

Explosion Chamber Spots Motor Hazards

ELECTRICAL equipment that might ignite explosive coal dust or gas-and-air mixtures in coal mines is quickly detected by this new explosion test chamber. The hood of the chamber is raised by hydraulically operated hinges, as in photo at right, which shows engineers preparing a motor for a test. When the hood is lowered, an explosive mixture of gas and air is pumped into the chamber and inside the motor housing. A spark plug ignites the gas inside the motor. If the resulting explosion is confined within the motor, it passes the safety test and is given an explosion-proof rating. If it fails, the explosion is released through diaphragms on



top of the chamber. In the case of coal-mining machines, each electrical part must pass at least 10 explosion tests before it is approved by the U.S. Bureau of Mines for underground use.

Inflatable Plastic Hat Keeps the Rain Off

THE raincoat the young lady below is wearing will protect her clothing from the rain. But what about that nice hairdo? Nothing to worry about. She digs in her purse, and takes out a little package. A few easy puffs into a valve, and a tubular rim is inflated to make a hat the size of an umbrella.

Under the big top, she has both arms free for carrying packages and purse. The rain bonnet, made of Vinylite plastic, is said not to crack or peel even after repeated foldings. It comes in red and blue plaid and in plain colors. Rain Bonnet, Los Angeles, makes the umbrella hat.





The skates this girl is lacing on are precision-built. With the shoes, they cost more than \$100. Fancy skaters use them.



How Rink Rollers Are Made

Roller skating is just for kids? Not at the rollerdrome, where the champs do their stuff in \$100-a-pair skates.

By George H. Waltz, Jr.

PS PHOTOS BY W. W. MORRIS

ONE hundred dollars for a pair of roller skates?

That's a lot of money for eight wheels mounted on a pair of shoes. Yet, many of the youngsters wheeling, spinning, jumping and dancing at your local roller rink this month paid that much. Maybe more.

Top-quality rink skates, the kind preferred by serious amateurs as well as professionals, are no longer a stamped-out product of an assembly line. They are precision-built to take the strains and stresses

of dance, figure and free-style skating, to say nothing of "roller derby" skating.

Skilled workmen produce them by hand on small machine tools—small drill presses, arbor presses, bandsaws and jigs and fixtures—the kind you find in a well equipped metal-working home shop. One of the most popular—and expensive—precision-built roller skates made today, in fact, was first made in a small basement workshop.

Four years ago, dark-haired, stocky Rocko DiCandia, then in his middle twenties, was a machinist employed in a plant in Brooklyn. His evenings were divided between two pet hobbies—puttering around in his basement shop and roller skating.



Like other ardent rink fans he often stopped at the local skate shop to join the bull sessions about skates and skating. Leo Monte, the owner of the shop, soon realized that Rocko DiCandia was an expert machinist and metal worker. And DiCandia discovered that Monte and his assistant, "Doc" Parker, a gray-haired oldtimer at the skating game, had some pretty sound ideas about how a top-quality roller skate should be built.

DiCandia and his younger brother enlisted the off-time help of a few mechanically minded friends, and began producing precision-built roller skates according to Monte's and Parker's design. During the first year, they produced almost 200 pairs of these de luxe skates in DiCandia's basement shop.

Rolls-Royces of the Rollerdomes

That was in 1949. Today, Rocko DiCandia, still under 30, no longer spends his days working for someone else. He has his own modern one-story plant in Maspeth, Long Island, where each spring he and his brother supervise a half-dozen employees in the production of more than 1,000 of the now famous "Glideaway" roller skates for the fall and winter seasons. The rest of the year, they run a profitable tool, die and sheet-metal shop.

Leo Monte, who was responsible for getting Rocko into the skate business, now distributes DiCandia's "Glideaway" skates. He and "Doc" Parker also operate a pair of skate shops—one in Manhattan as well as the original one in Brooklyn.

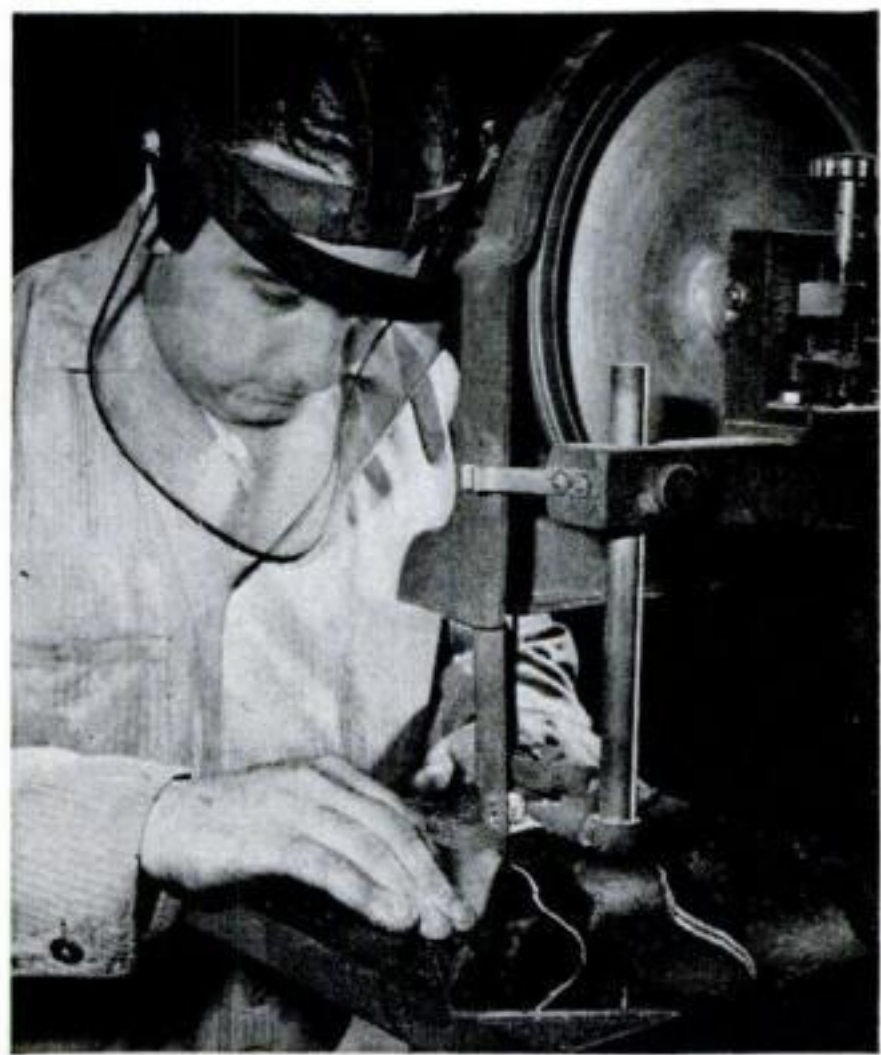
The skates that DiCandia and the other manufacturers of precision rollers turn out are a far cry from the steel-wheeled strap-on variety that sell for a few dollars. They

might well be called the Rolls-Royces of the rollerdomes.

Skaters Are Rugged Individualists

The trucks for the wheels and the hangers for the trucks are made of tough aluminum alloy. Special tool steel is used for the axles, while a heat-treated alloy steel is used for the kingpins that hold the trucks in place. And to provide just the right "action"—that's the amount of rock-over, or roll, from side to side—the trucks are cushioned by rubber pads that can be adjusted to different resiliencies.

Since roller fans are rugged individual-

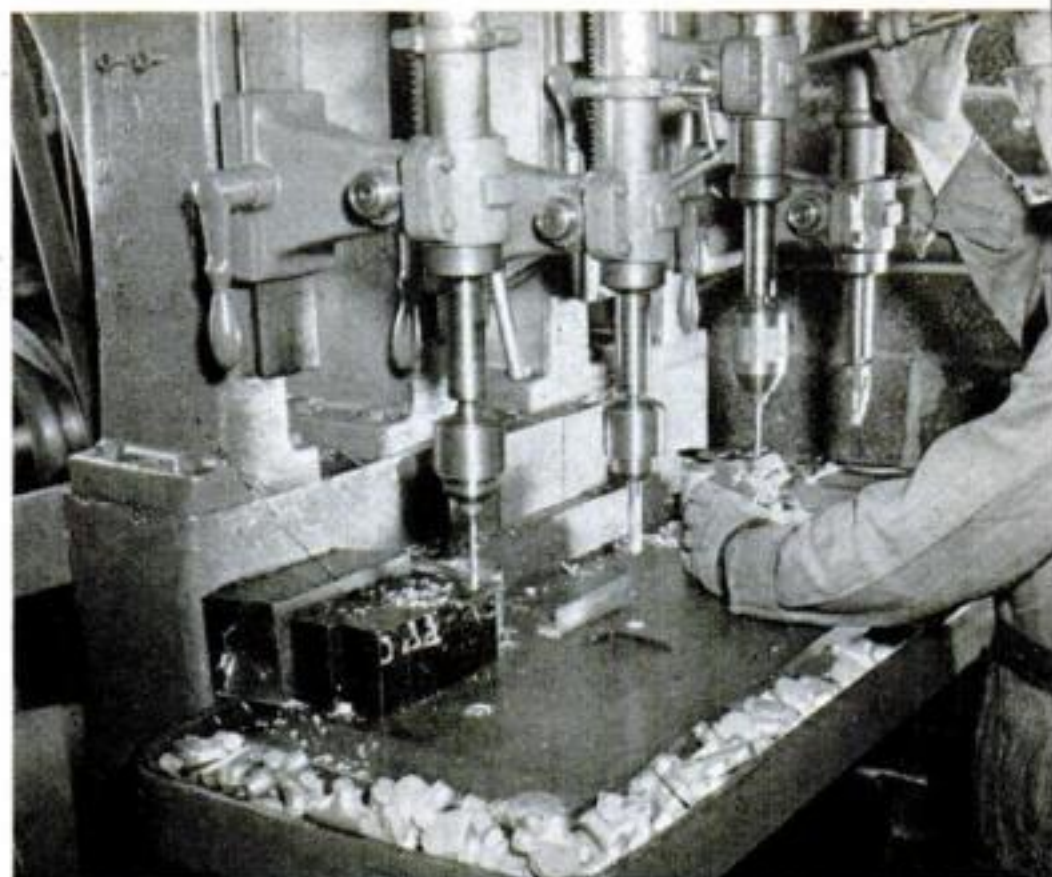
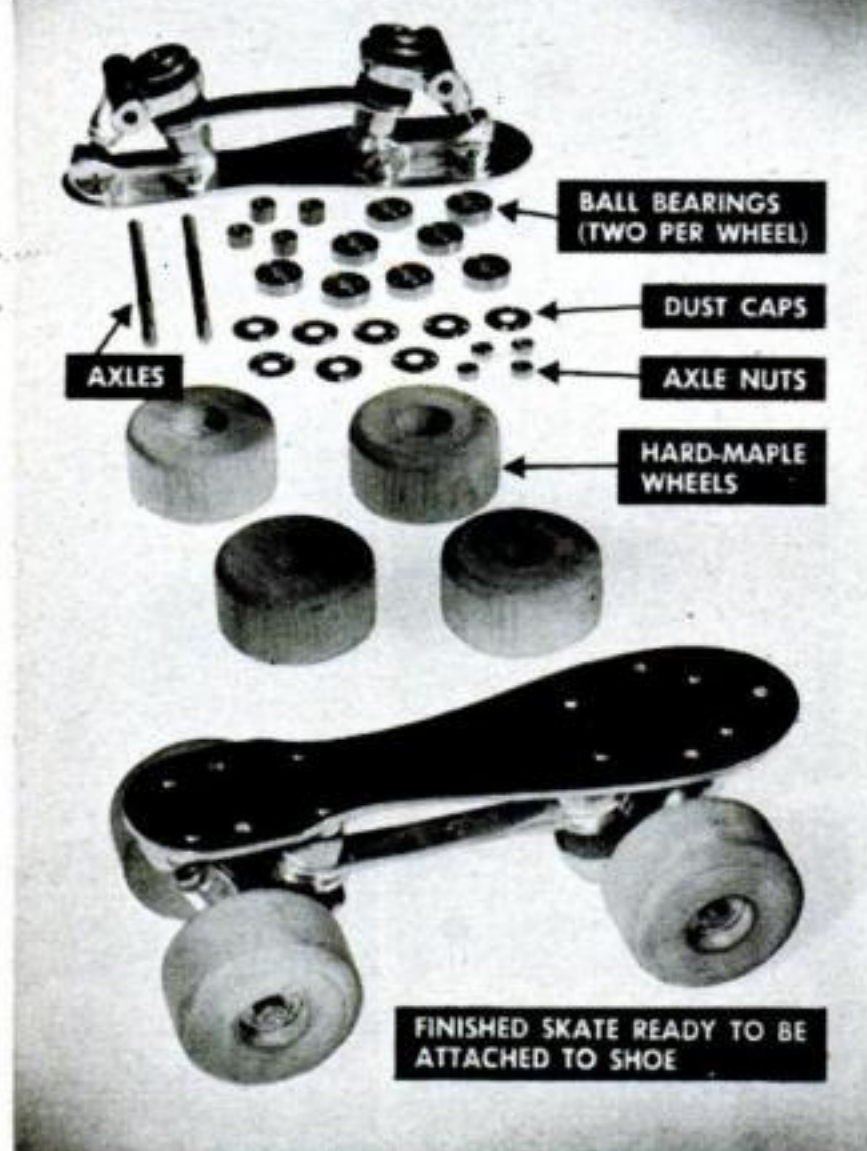


Rocko DiCandia, manufacturer of one of the top precision-built skates, started making them in a basement workshop. Now he has a modern plant located in Maspeth, L. I.

THE MANUFACTURER ASSEMBLES THESE PARTS



THE DEALER FINISHES THE SKATE

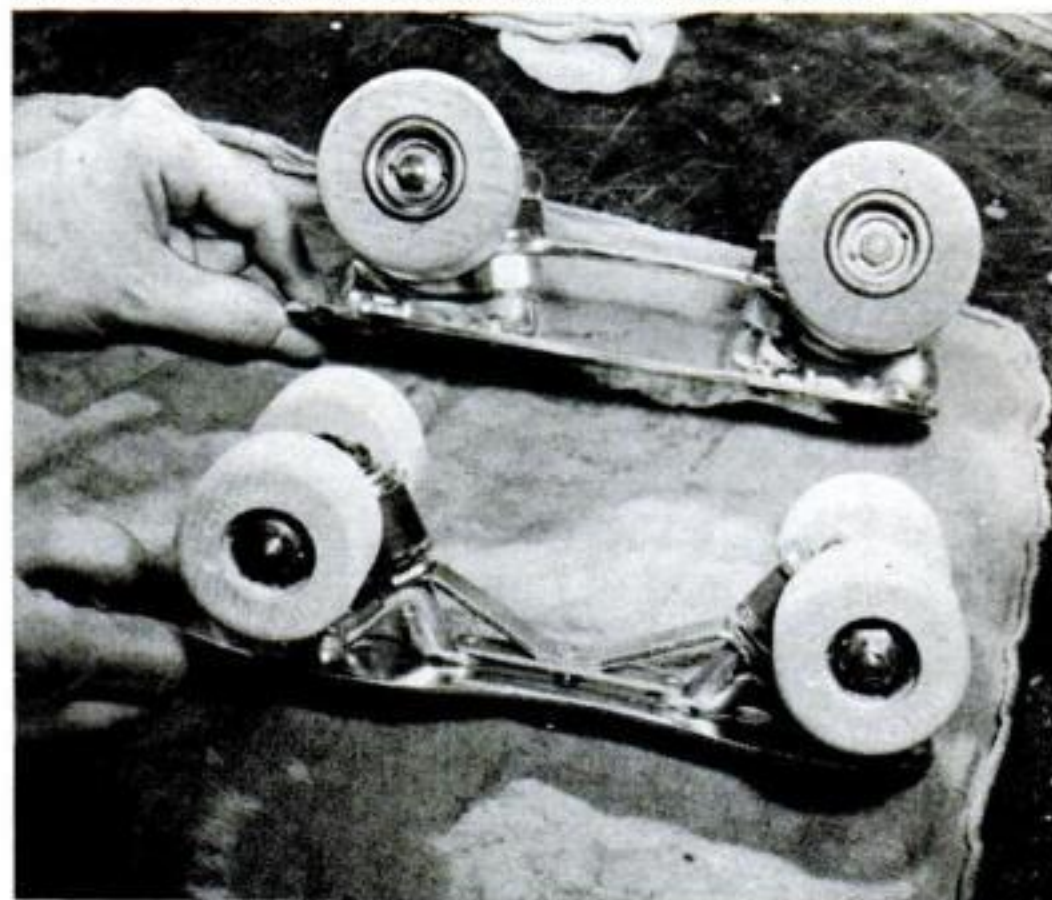


Drill presses play a large part in manufacturing DiCandia's "Glideaway" skates. Castings made of a special aluminum alloy are bought and then drilled as required and finished.

ists, most precision skates are sold without wheels. The buyer selects his own. Most skaters prefer solid hard-maple wheels—to match the hard-maple board surface used on most rinks—but others want plastic wheels, fiber wheels, laminated wheels or wheels made out of the asbestos composition used for automobile brake linings.

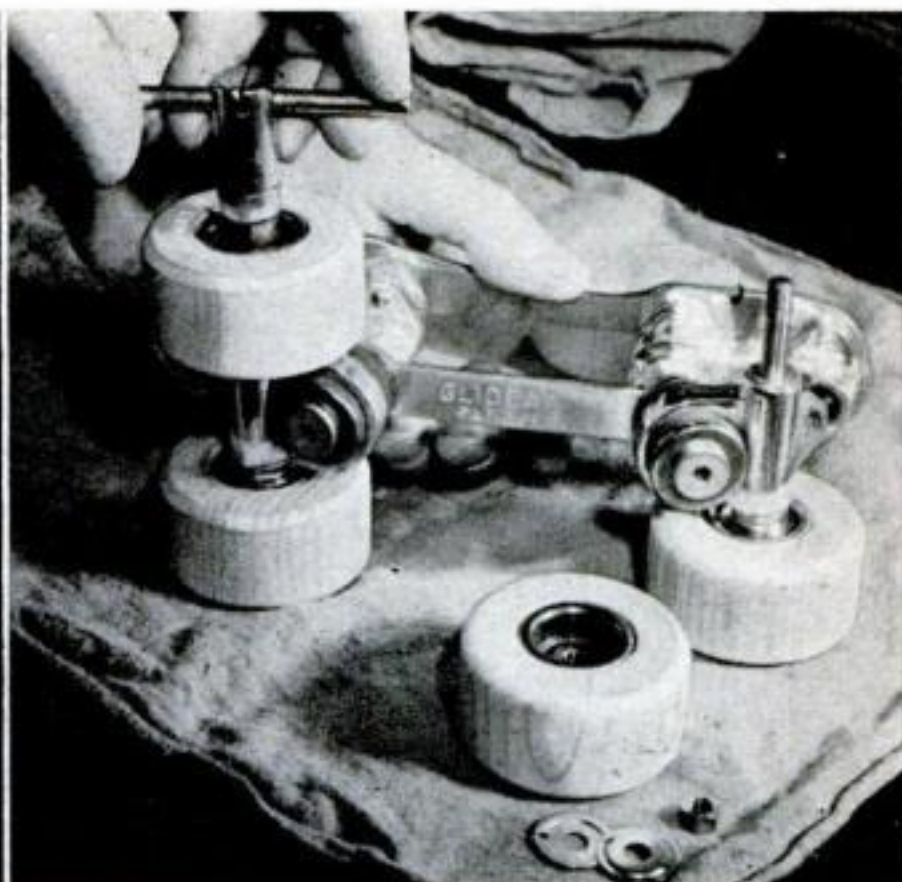
Wheel diameter and wheel width also are matters of personal preference. And for short gals who like to skate with tall boys,

Racing skate (in foreground) differs from skate used by dance, figure and free-style skaters. The king bolt holding the trucks forms a wider angle to provide a longer skating platform.





Hard-maple wheels used on skates roll on two sets of ball bearings—one is placed on each side of the wheel, with a spacer between. Bearings are pressed into the wooden wheels.



Actual assembly of wheels on skate is done by the dealer at the time he sells the skates, as indicated on opposite page. Dust caps are placed over bearings before nut is put into place.

there's even an extra-large-diameter "now-she-can-be-as-tall-as-you-are" wheel!

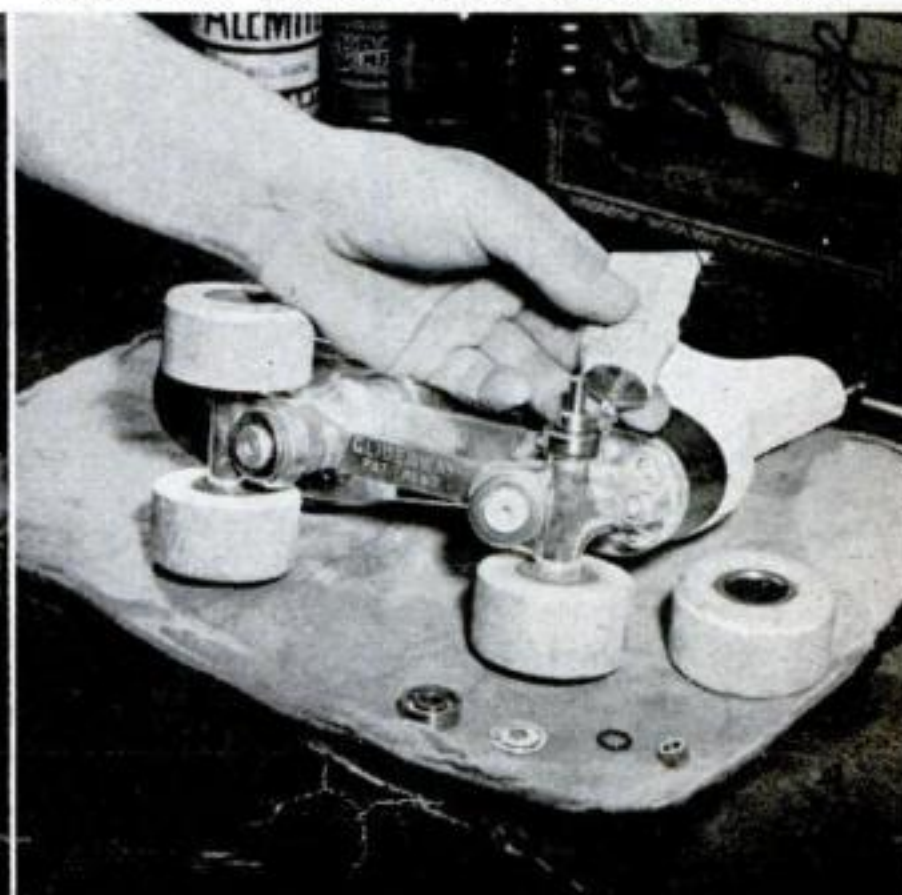
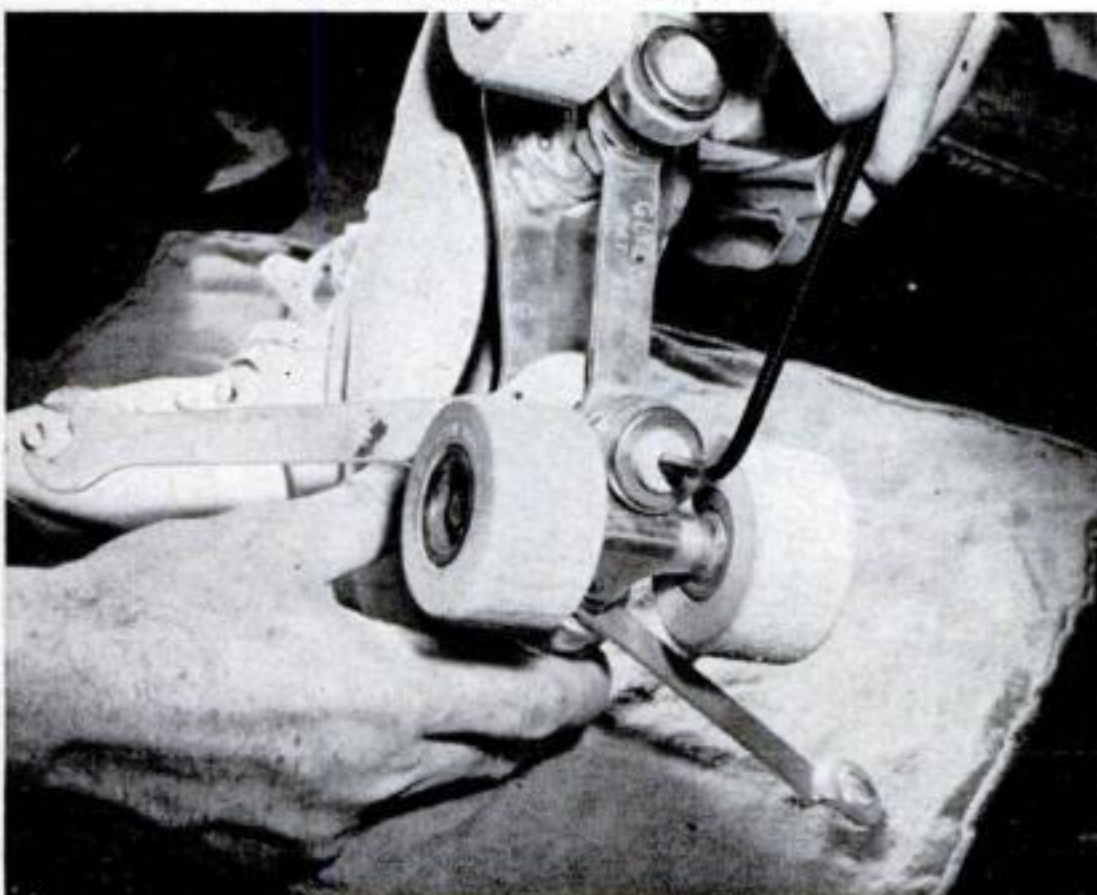
Roller-rink skates, like ice skates, require periodic grinding but not for the same reason. Ice skates are ground to sharpen them; roller wheels are ground to resurface them, to remove any irregularities caused by wear. In roller skating, they—in effect—sharpen the surface of the rink rather than the skates, coating the maple floor boards with a mild abrasive that provides just the

right amount of "tooth" to prevent skidding and sliding. This abrasive may be plaster of Paris or pulverized stucco.

If you still think \$100 is a lot to spend for a pair of skates and shoes, talk to your local rink owner. The chances are that he paid better than a dollar a square foot for the maple surface of his rink. Figuring the average rink at 200 by 400 feet—and that's comparatively small—that means an initial cost for the floor alone of \$80,000! **END**

Three adjustments can be made in the action of a precision-built skate. Each helps to control the amount that the skater's foot can move from side to side on the rollers.

Wheel lubricants vary. Some skaters like free-rolling wheels, use light oil. Others, particularly fancy skaters who want their wheels to stop when they leave the floor, use grease.



ANTIQUE TOYS

STILL DELIGHT THE KIDS



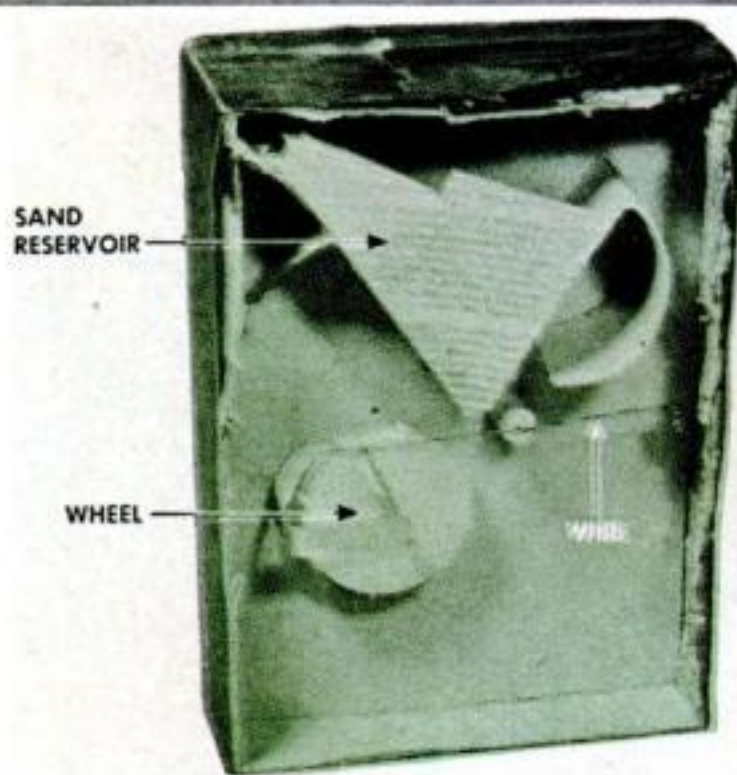
Called "Polly Peddler," this quaint 19th-century doll has about 400 miniature items for sale: mops, playing cards, laces, dishes, jewelry. Women in the past often demonstrated dressmaking ability by outfitting the dolls as elaborately as possible.



To deposit money in this 1896 bank, "William Tell" shoots apple off his son's head. When marksman's right foot is pressed, crossbow shoots coin, placed on its stock as above, at apple. Apple falls back and coin drops into bank. By lowering child's right arm, apple is restored to his head. Toy's original price was \$1.50; today it is worth \$25.



Built in 1850, this box is a mechanical sand toy. To make the musicians "play" their instruments, it is first turned upside down to collect the sand at top. Then it is righted and sand trickling through mechanism in box causes



players to move. Operated like the one at left, the sand toy above has its back removed to show the mechanism. When sand in the reservoir falls on the wheel, a spring activates the long wire that in turn moves the figures.

WHEN your great-grandad was a boy, he may well have played on Christmas morning with toys like the ingenious 19th-century playthings pictured on these two pages. In spite of their age, all the mechanical toys shown are still in working condition

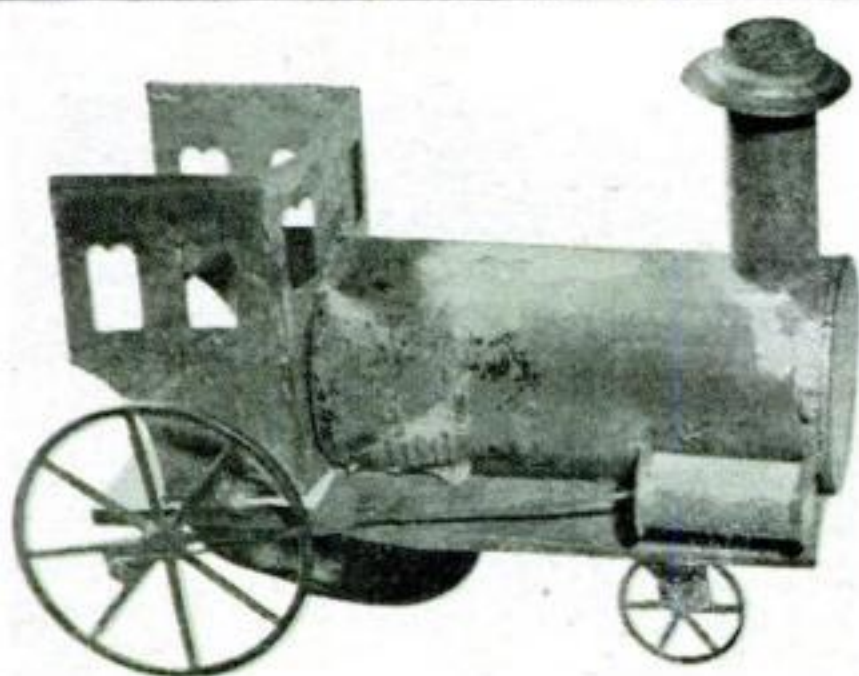
—a tribute to the skill and workmanship of yesterday's toymakers. Borrowed from private collectors, museums, and manufacturers, these toys are a selection of those displayed by the Toy Guidance Council, Inc., of New York City, at a recent antiques exhibit.



The cast-iron toy above is another mechanical bank. To operate it, a coin is placed in the dog's mouth, and a lever is pressed. This releases a spring-loaded, pivoted bar to which the animal is attached, making him jump through the hoop



and drop the coin in the barrel. To make the dog go through his trick again, he is pushed back to his original standing position. Built in 1903, the bank was priced at about \$2 when new; it is valued at \$50 today.



A clockwork mechanism runs this trackless, tin locomotive, one of the first made by the Ives Co., once-famous toy manufacturer. Built around 1875, original price of the locomotive was \$5; as a collector's item it is worth \$100.



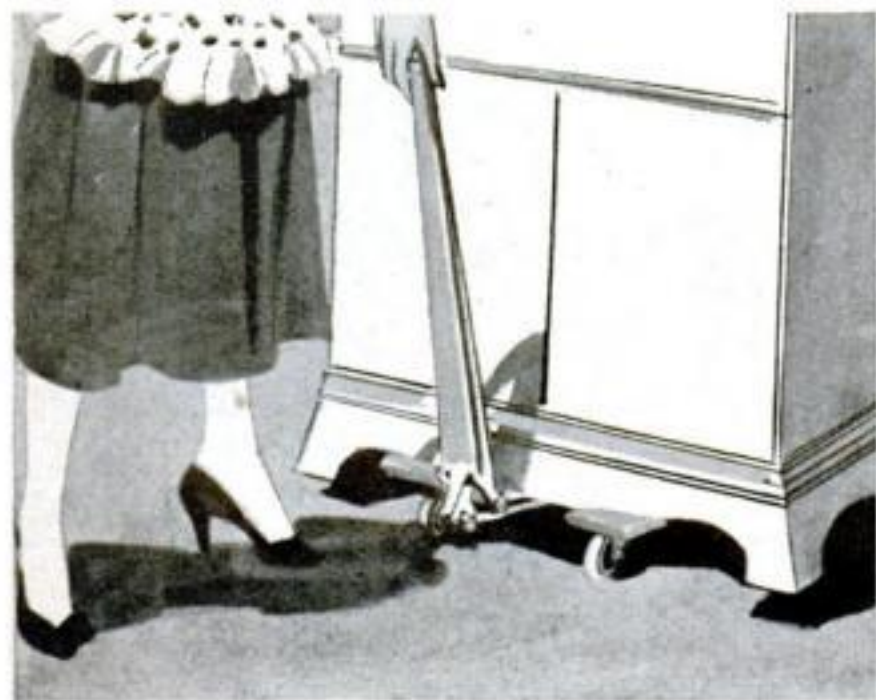
The crude-looking toy shown in close-up above is the kind of rattle babies played with in the early 19th century. Hand-carved, the rattle has a head made of loose-fitting, interlocking pieces that make a noise when shaken. **END**

I'd like to see them make...

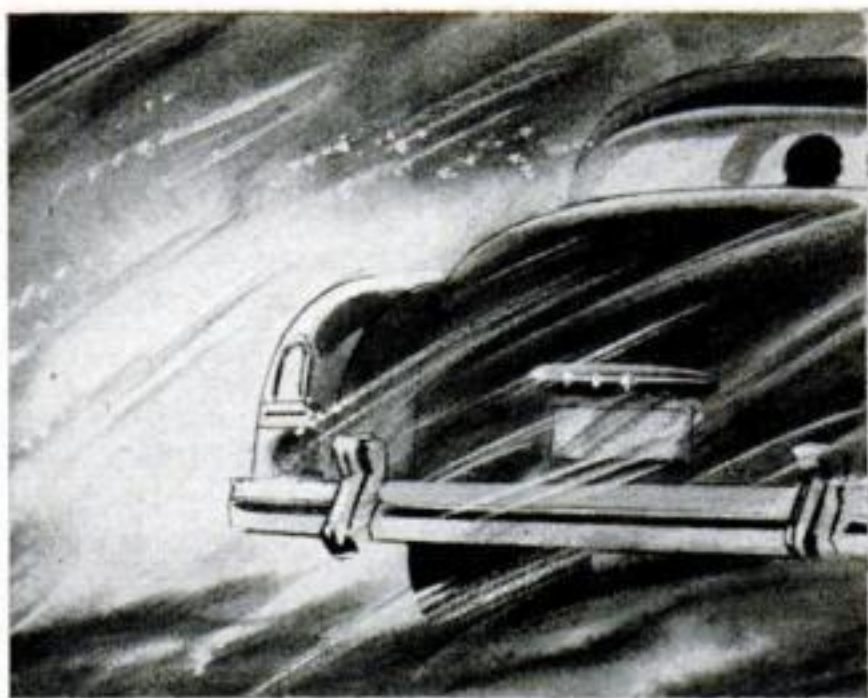
Everyone has his own pet idea of some gadget he would like to see in general use. What is YOURS? Popular Science will pay \$5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.



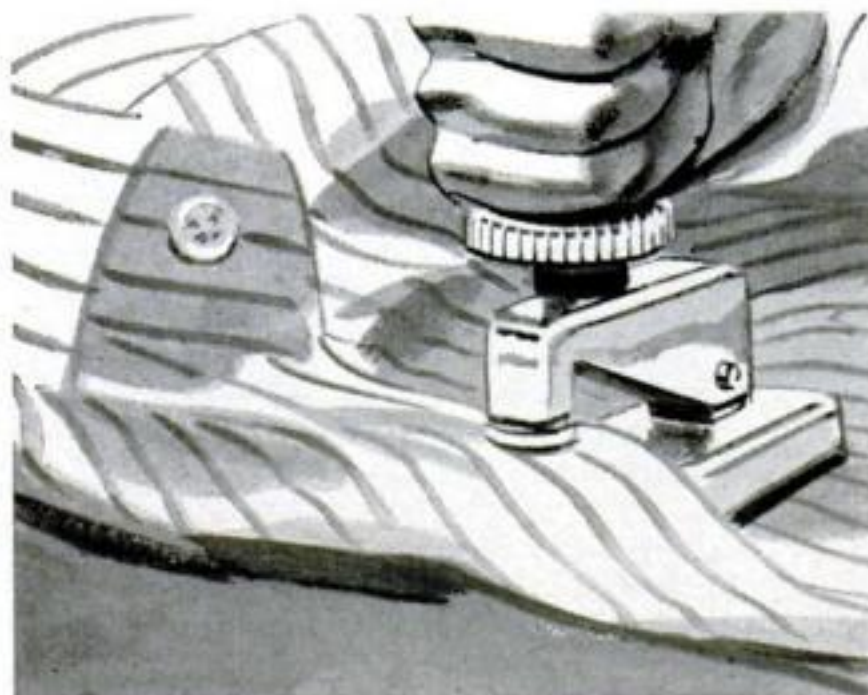
Lights underneath theater seats of the type that pop up when unoccupied. As patrons leave and seats fold up, lights would glow dimly, indicating available seats to newcomers.—Mrs. Michael Fey, New York City.



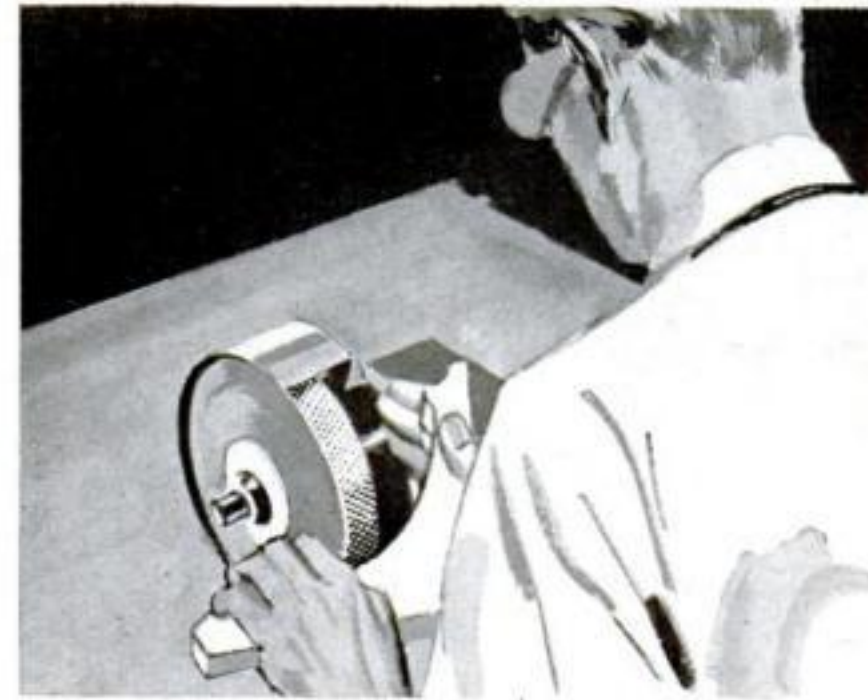
A lightweight jack on casters for household use. Something easy for the little wife to handle every time she wants the furniture switched around for cleaning or just plain rearrangement.—Andrew Brennan, Philadelphia.



Tail-light bulbs with dual filaments. Controlled from dashboard, light could be switched to greater brightness in fog or snow, or left at normal intensity for ordinary driving.—Kenneth Holstein, Tracy, Minn.



A stapler for shirt buttons. When a button comes off, one blip of the fist would fasten another in place with enough play to allow buttoning and unbuttoning. Fine for bachelors.—Howard P. Fischer, Monaca, Pa.



A rasping wheel, similar to an emery wheel, that could be mounted on a grinding spindle. A set of these wheels with different surfaces would shape wood rapidly and easily.—C. L. Stewart, Alabama City, Ala.

Is Your Car as Pretty as a Jeep?

The GI's sturdy "sardine can on wheels" is one of eight automotive masterpieces shown at N. Y. Museum of Modern Art.

By Herbert O. Johansen

PS PHOTOS BY HUBERT LUCKETT

A FRIEND of mine had just finished washing and polishing his car as I came along. It was gleaming from grinning grille to flowing fenders. Joining me at the end of his driveway, he beamed like a proud father:

"Boy, she sure is a beauty!"

"That's just your opinion," I said smugly. "The automobile should be viewed as a hollow, rolling sculpture . . ."

"Where did you hear that?" my friend interrupted.

"At the Museum of Modern Art, in New York City, where the true connoisseurs of



"Family Group," a massive sculpture by Henry Moore, sets an appropriate mood for the bodies beautiful of the "8 Automobiles" exhibit at the New York Museum of Modern Art.

automobile beauty gather," I said to him. "You're kidding?"

"No, honest. The Museum of Modern Art picked out eight cars to display like statues." I pulled a glossy catalogue from my pocket. "Didn't you ever stop to think what automobiles really are? Just listen to this." I then read from the Museum's catalogue:

"They have interior spaces corresponding to an outer form, like buildings, but the designer's esthetic purpose is to enclose the functioning parts of an automobile, as well as its passengers, in a package suggesting directed movement along the ground . . . Its successful introduction to an automobile design is generally the result of one or two basic approaches. The first of them is the conception of an automobile as a box resting on wheels . . ."

I paused and looked at my friend's car.

"That's no box on wheels," my friend said indignantly. "What do they consider a beautiful car? A jeep?"

"Don't sneer at the jeep, friend—it's one

Pretty Cars



of the chosen eight at the Museum exhibit."

"Oh, my aching back."

"It's the esthetic we're considering," I reminded him, "not your painful memories as a GI driver. Let me quote the Museum on the jeep."

I didn't have to refer to the catalogue. This part I had memorized.

"The admirable jeep seems to have the combined appeal of an intelligent dog and a perfect gadget."

A doglike snort came from my friend.

"The jeep," I continued reading, "looks like a tray, or perhaps a sturdy sardine can, on wheels. Part of the top appears to have been cut open and folded up, to serve as a windshield. From it a canvas canopy can be stretched over some metal struts to the back of the car, thus affording temporary shelter from the rain. Large wheels dominate the design, and insist rather than suggest that the jeep's primary purpose is transportation."

"Maybe the guy's got something there," my friend admitted as I paused. "Except for keeping the rain out . . ."

Jeep Is Machine Art

To answer his point, I read on: *"Those who have used the jeep will recall certain limitations of comfort."*

"Oh, brother! . . . But what makes it beautiful?"

"Beauty, my friend, takes many forms. The jeep, and I quote, is *one of the few genuine expressions of machine art*. And here's another example of machine art." I turned a few pages of the catalogue and pointed to photos of another car beautiful enough to stand alongside the Museum's statues.

"I know that one," said my friend, "the British MG. It's cute and a lot better looking than the jeep."

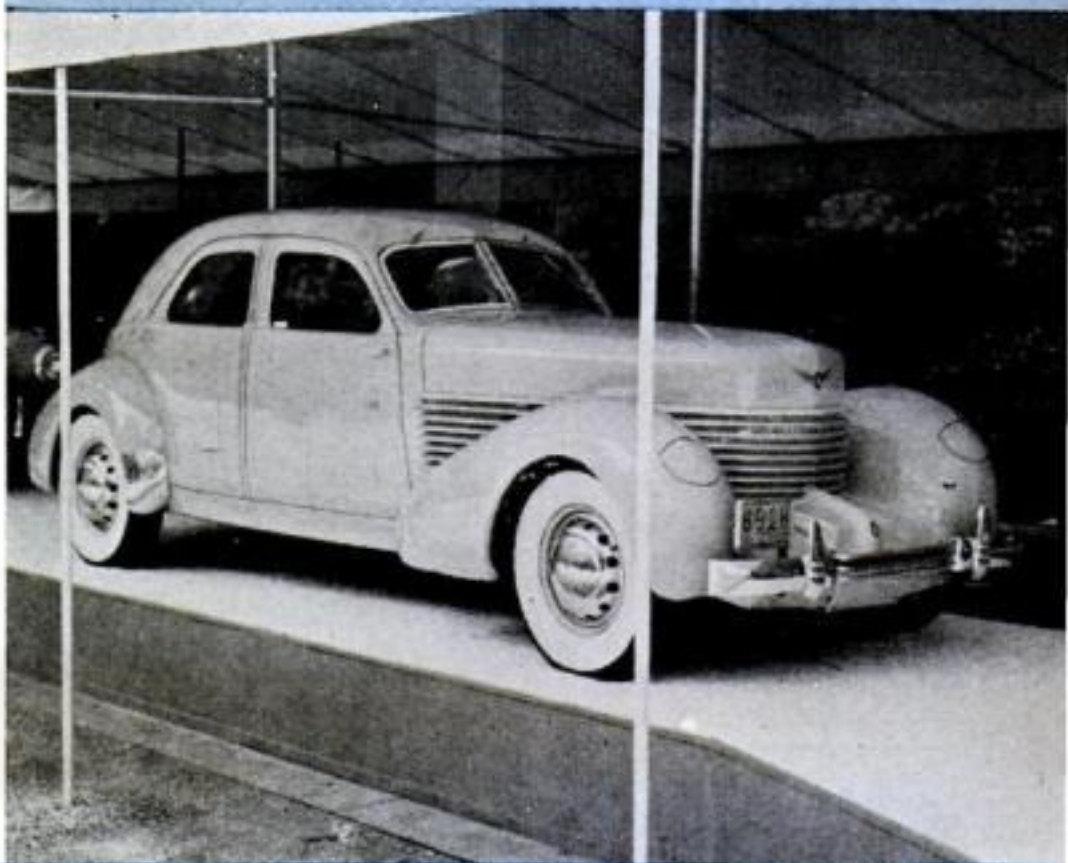
"Precisely. Here is the critique: *The MG gives the illusion of being the unenhanced piece of machinery which the jeep actually is. Unlike the jeep, however, the MG's stylistic understatement is the result*



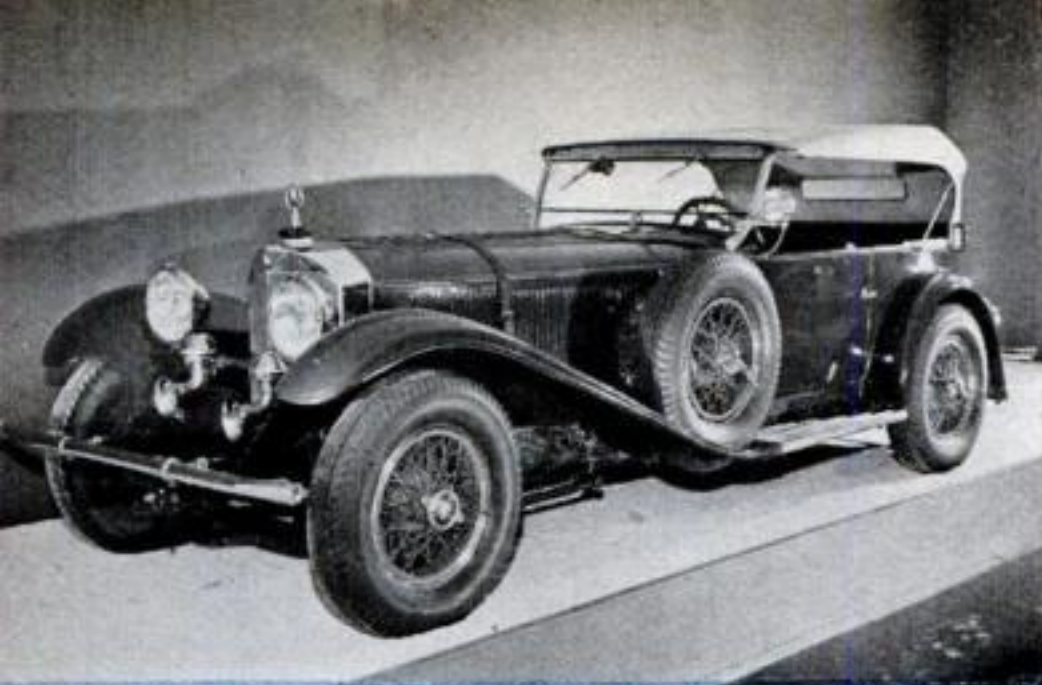
Cisitalia, 1949, Italian. A single-envelope design. The grille is a modified cross section of the hood. Wheels are decorated with slotted, chromium-plated disks.



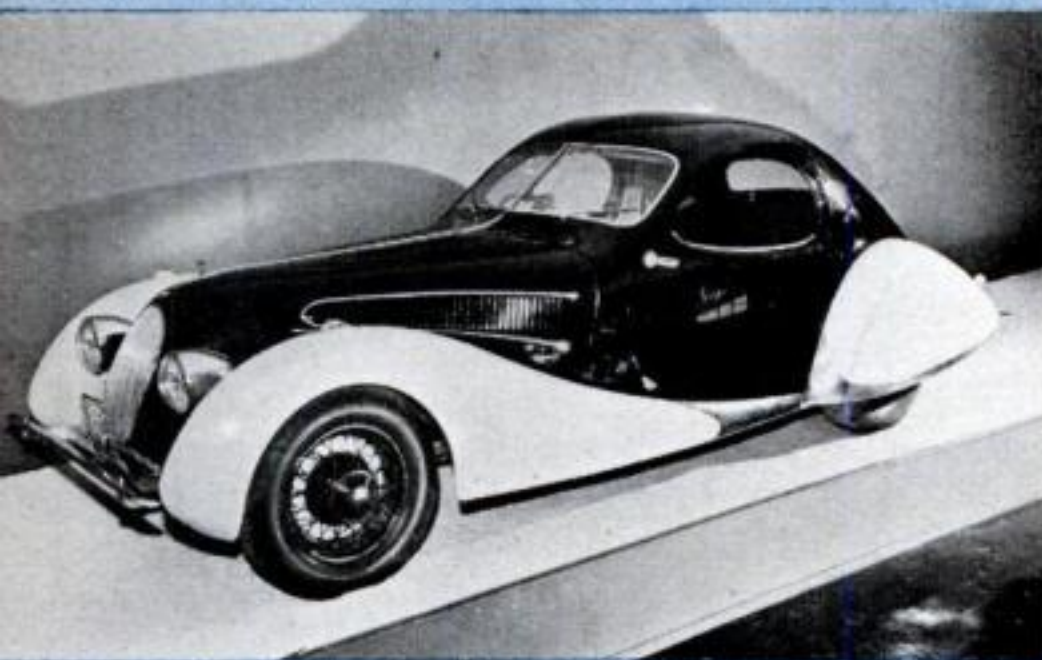
Bentley, 1939, British. Characteristics of this car are its sharp, clearly defined edges and a trunk that appears to have pushed its way through the tonneau.



Cord, 1937, American. Here the designer has contrasted a coffin-shaped hood with massive, streamlined fenders. Another feature is grille extending along the sides.



Mercedes, Model SS, 1930, German. The classic box on wheels. Big engine is placed well behind front wheels for proper weight distribution and steering performance.



Talbot, 1939, French. Several envelopes are combined in this car. Front and rear fenders, connected to each other at the base line, seem to cradle the passenger compartment.



Jeep, 1951, American. Engineered as a tool for transportation, design grew out of practical considerations, even to rounded fender corners to prevent cutting passengers.

of an intense but devious preoccupation with appearance. Its designers have chosen simply to elaborate the look of a machine."

My friend looked a bit baffled. "I still like it," he said, "especially those wire wheels."

"Yes." I quoted: "The wheels are animated by sparkling wire spokes and extravagantly slender rims, resembling the wooden hoops children play with."

"Okay, okay," said my friend. "I remember those wire wheels on the old Mercedes." He paused, looking up at his car. "That Mercedes was a beauty, too," he added.

"You're in the groove," I told him, turning the catalogue pages to photos of the Mercedes.

"What a hunk of car!" he said admiringly. "How does it stack up in this art lingo?"

Mercedes Is "Amusingly Solemn"

"The designer of the Mercedes," I read, "regards an automobile as four enormous wheels carrying a box. No detail relaxes for a moment its authoritative carriage, no intransigent decoration mollifies its stern purposefulness; but for all that, the Mercedes combines an extravagance of metal with quantities of hardware in an amusingly solemn piece of stagecraft."

I turned a couple of pages. "And here's another box, the Bentley—but with each side clearly defined and limited by a sharp edge, it says here. Attention is thereby focused on the intersections of surfaces, rather than on the surfaces themselves. The intersections produce the Bentley's characteristic swift and precise contour—the famous razor edge."

"I see what they mean—about the razor edge," said my friend. "But what's that car you skipped between the Mercedes and the Bentley?"

"That's the Italian Cisitalia," I said, turning a page. "And here we get a different art approach. It minimizes the distinction between separate parts by enclosing them all in a single metal shell. Anyway, that's how Arthur Drexler—he's Curator of Architecture at the Museum—puts it."

"Streamlining?" my friend said brightly.

"Well, an envelope—an envelope that covers box and parts. Here's what it says:

"The second approach emphasizes the idea of light, unencumbered movement. In its ideal version the type appears to be a single envelope covering passengers and motor as well as accessory parts. Modeling the en-

Pretty Cars



velope as though it were sculpture helps to indicate what has been covered. In this way surface undulations are used to describe the wheels (which may no longer be visible) or to provide a setting for lights, these mechanisms often being held within the envelope as an eye is contained in one's head."

My friend took the catalogue, thumbed through it, and pointed to the French Talbot. "What about this one?"

"Ah, the Talbot," I said knowingly. "Unlike the Cisitalia, which has a single envelope slipped over its chassis, the Talbot has several envelopes that require only minor punctuation."

"Too fancy for me," was my friend's only comment. Then, "Look, here's the Cord. I don't wonder they picked that one. And if that's a box on wheels, I like it."

"So does Arthur Drexler. He and the Museum director, Philip C. Johnson, picked the cars for the '8 Automobiles' exhibit."

"Let's see what they say about the Cord."

I had this down pat, too. "The designer may choose a basic box shape for the major part of an automobile, and relate it to

shapes of different sculptural character. The Cord combines balloon-like fenders with a deliberately contrasting squared body. What all the parts have in common are rounded corners to blunt and soften the intersection of planes."

"I guess that's good then," said my friend. "Any more American cars?"

"Here's the Lincoln Continental."

My friend grabbed the catalogue. "Oh, boy!" he exclaimed. "Wait'll I tell the old man his car made the Art Museum. And look what it says: *The Lincoln Continental satisfies the requirements of connoisseurs while capturing the imagination of a public less preoccupied with the refinements of automobile design. He'll have a fit when he reads that.*"

What Makes a Connoisseur?

"Why?"

"Well, he won't know whether he's a connoisseur or just the public."

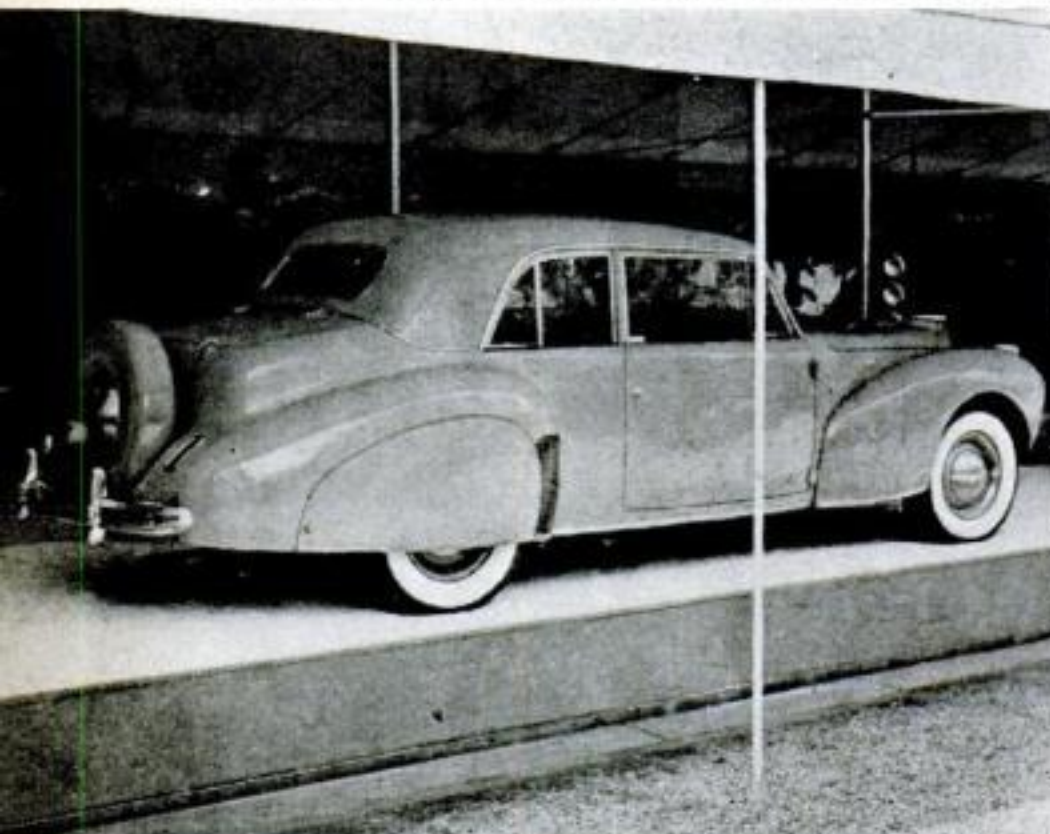
"That may be just the point of this whole exhibit," I said. "Maybe it will help both the public and car designers to become connoisseurs—pay more attention to principles of design. Take yourself, for instance. Now that you've seen the 'Beautiful 8,' what do you think of your car—honestly?"

My friend stood back in the driveway, looked at his car with the squint of an artist absorbing the esthetic lines of Venus de Milo.

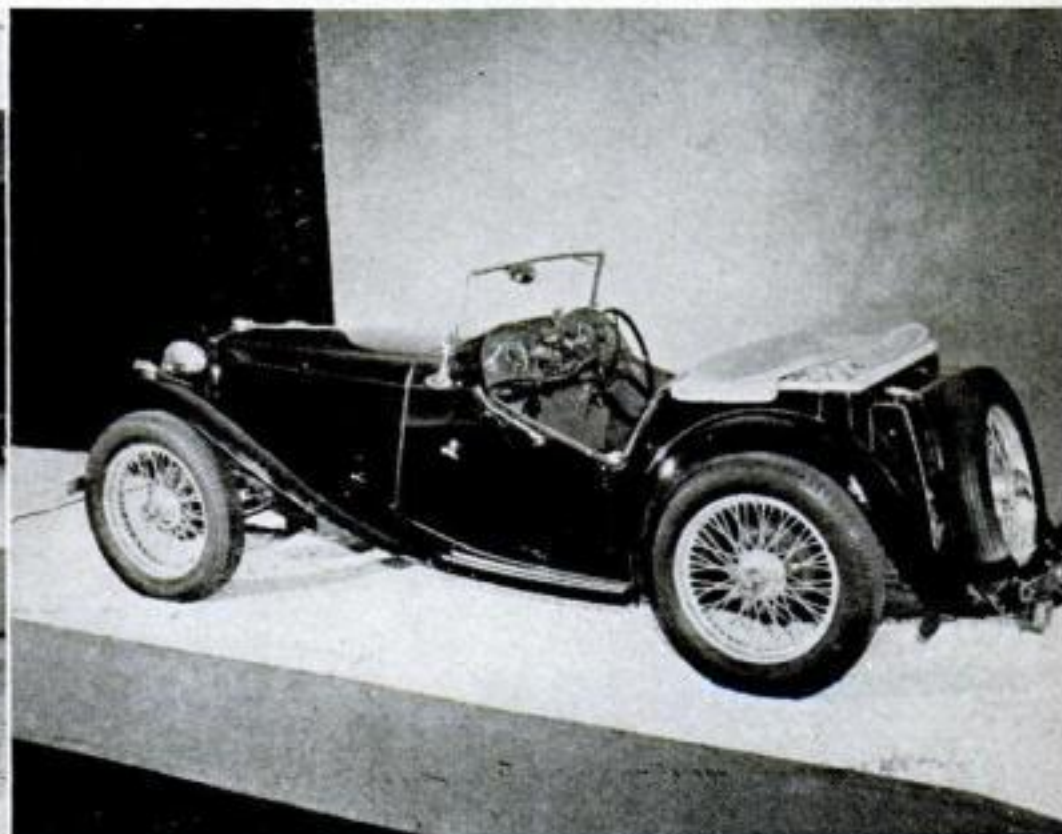
"Boy, she sure is a beauty!"

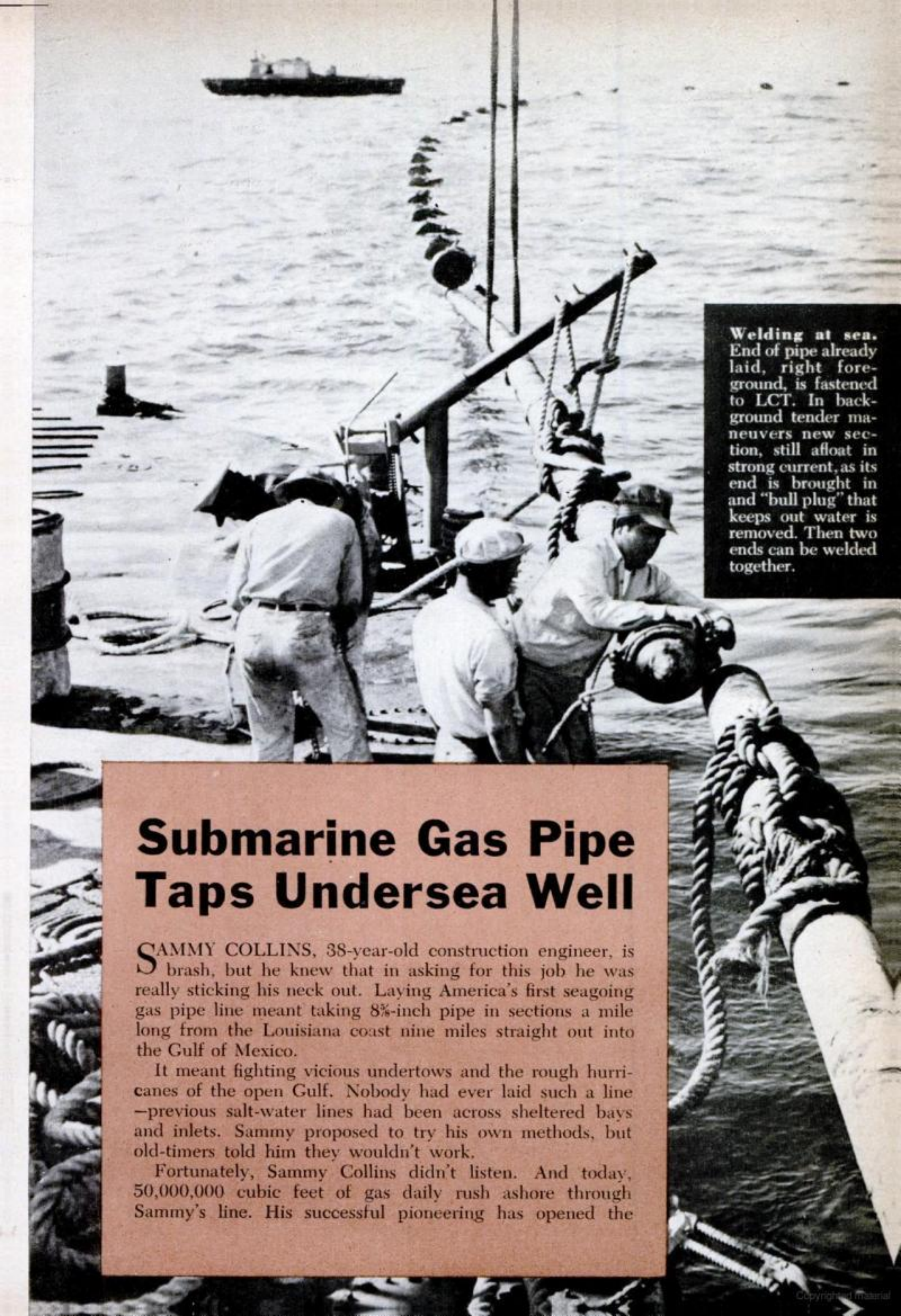
END

Lincoln Continental, 1941, American. Like the Cord, a box to which fenders have been added. Instead of contrasting, however, front fenders are kept flat and tight to the sides.



MG, Model TC, 1948, British. The front and back give the appearance of separate boxes connected by a shallow passenger compartment. Like Mercedes, it has those wire-spoke wheels.





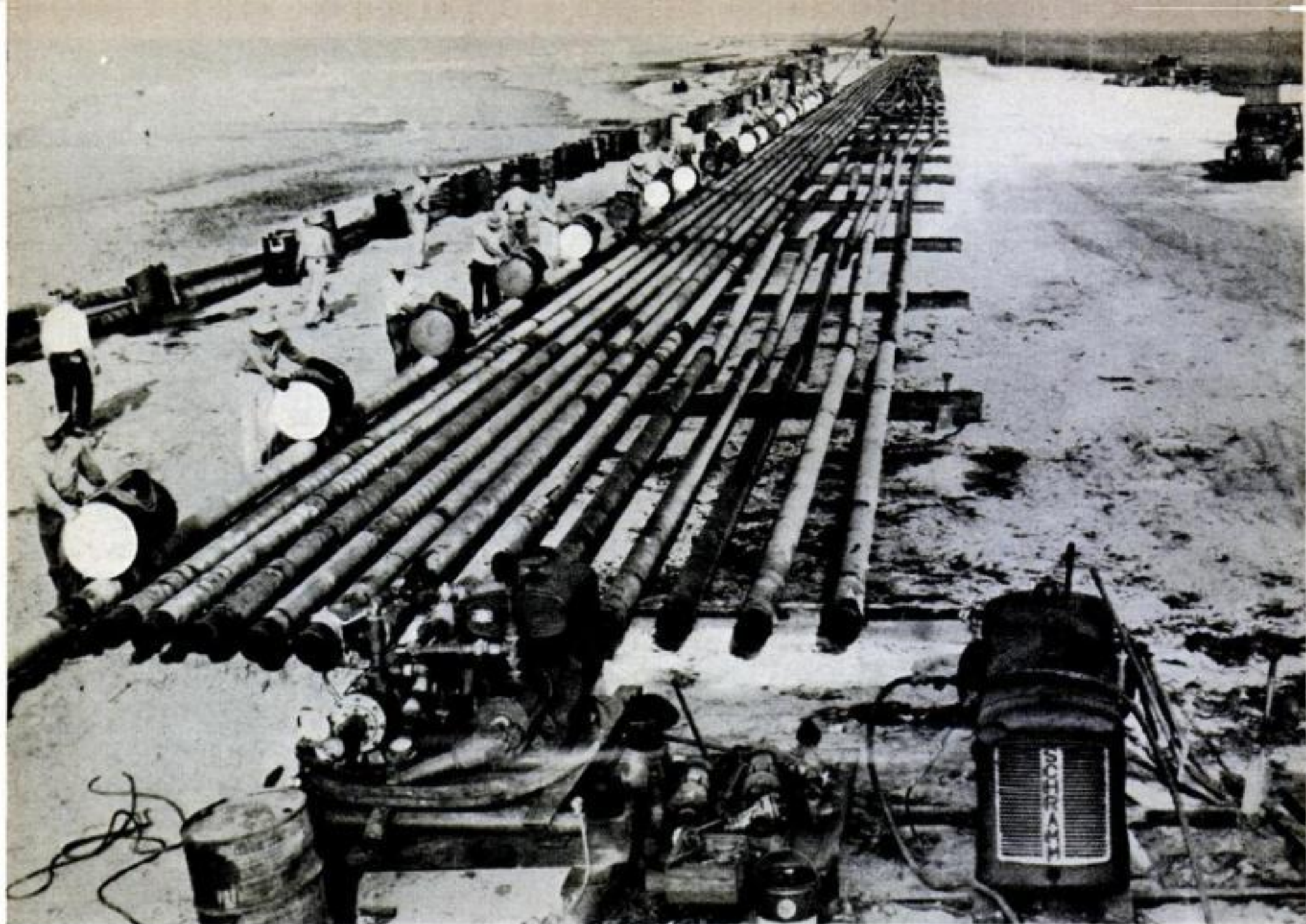
Welding at sea. End of pipe already laid, right foreground, is fastened to LCT. In background tender maneuvers new section, still afloat in strong current, as its end is brought in and "bull plug" that keeps out water is removed. Then two ends can be welded together.

Submarine Gas Pipe Taps Undersea Well

SAMMY COLLINS, 38-year-old construction engineer, is brash, but he knew that in asking for this job he was really sticking his neck out. Laying America's first seagoing gas pipe line meant taking 8½-inch pipe in sections a mile long from the Louisiana coast nine miles straight out into the Gulf of Mexico.

It meant fighting vicious undertows and the rough hurricanes of the open Gulf. Nobody had ever laid such a line—previous salt-water lines had been across sheltered bays and inlets. Sammy proposed to try his own methods, but old-timers told him they wouldn't work.

Fortunately, Sammy Collins didn't listen. And today, 50,000,000 cubic feet of gas daily rush ashore through Sammy's line. His successful pioneering has opened the



Forty-foot sections of pipe are laid out on beach and welded into 1,100-foot lengths. Emp-

ty oil drums are fastened to long sections (left) to float them out into the Gulf.

prospect of tapping the gas reserves that lie under the open waters of the Gulf. There's a lot of gas there—experts estimate that it amounts to 60 percent of the known reserves in the continental United States. And we need it: gas consumption has climbed 50 percent since 1945.

It All Started by Accident

The first line resulted from an accident. The Pure Oil Co. had drilled for oil in water 40 feet deep out in the Gulf—and struck gas. Oil could have been run into tankers from the drilling platform, but not gas. So Pure Oil abandoned the well temporarily. That was Sammy Collins' chance.

Sammy shares the profits and problems of the Collins Construction Co. of Port Lavaca, Texas, with five young associates. They soon found that the pipe-line job meant pioneering all the way. To start with, they had to bulldoze a beach 50 miles from the nearest supply center, build a road for trucks and barge in much of their equipment over sand bars at high tide.

Corrosion presented a major problem: salt water had wreaked havoc with many alongshore pipe lines. To resist it, Robert

C. Ledford, a director of the project, devised a new method of covering the pipes. First he put on alternate layers of plasticized enamel and glass fibers, then wrapped it with 70-pound Kraft paper. That worked.

On the beach, the 8½-inch pipe was welded into sections as long as three city blocks. When the first section was finished, it was placed on a runway, roped to a tug and towed into the Gulf, floating along on water wings made from empty oil drums. As the back end neared the water's edge, another section of pipe was welded onto it. The longest section that could be towed safely was a little more than a mile in length. One by one these sections had to be laid in place and anchored while the next one was welded on. A war-surplus LCT served as a floating welding platform.

Sleepless Crews Battle Storm

It sounds simple on paper. But Collins faced an offshore current so swift that a tug could make only a mile an hour against it. And he soon found that this part of the Gulf is rightly notorious for its vicious squalls. Rough weather plagued the project. One day a storm caught the tug puff-



Underwater pipe-line trencher, Collins' own invention, sinks to bottom where it will run

along pipe, blasting trench in bottom with powerful water jets. Pipe will settle into trench.

ing along with a tail of 5,600 feet of heavy pipe. Through fast work, the LCT hooked onto the head of the line while the tug shifted to the rear. They headed into a gale. For four days and nights the sleep-starved crews fought to keep the pipe line from breaking to pieces.

Sinking Pipe Outwits Barnacles

Even in calm weather, fitting two ends together for a weld at sea was a mean job. It took three days to out-fight the currents and maneuver the unwieldy mile-long sections of pipe into position for one weld. Work began at four A. M. and lasted until 10 or 11 at night.

Barnacles had been a major problem for previous submarine-pipe layers. These tiny shellfish had cut not only through the best pipe coverings, but into the pipes themselves. Now Collins pulled out his secret weapon. Barnacles cannot live underground, so Sammy decided to bury the pipe line.

For 15 years Sammy had experimented with a trench digger using high-pressure water jets. He could never get his jet digger to work properly on land, but it proved just the thing for underwater use. Fastened

around the submerged pipe line, the device aims a series of nozzles at the sea bottom. Then as it is propelled along the pipe, it shoots powerful streams of water into the mud, scooping out a ditch four or five feet deep. The pipe sinks into the ditch, and much of the whirling mud blasted loose by the jets settles back, burying it.

Spies Snoop Secrets

Sammy zealously guards the technical details of his jet trencher and the other mechanical devices he invented for underwater pipe-line work. One man on the project was discharged because Sammy suspected him of spying for a rival concern. Planes, obviously taking movies, flew low over the project several times.

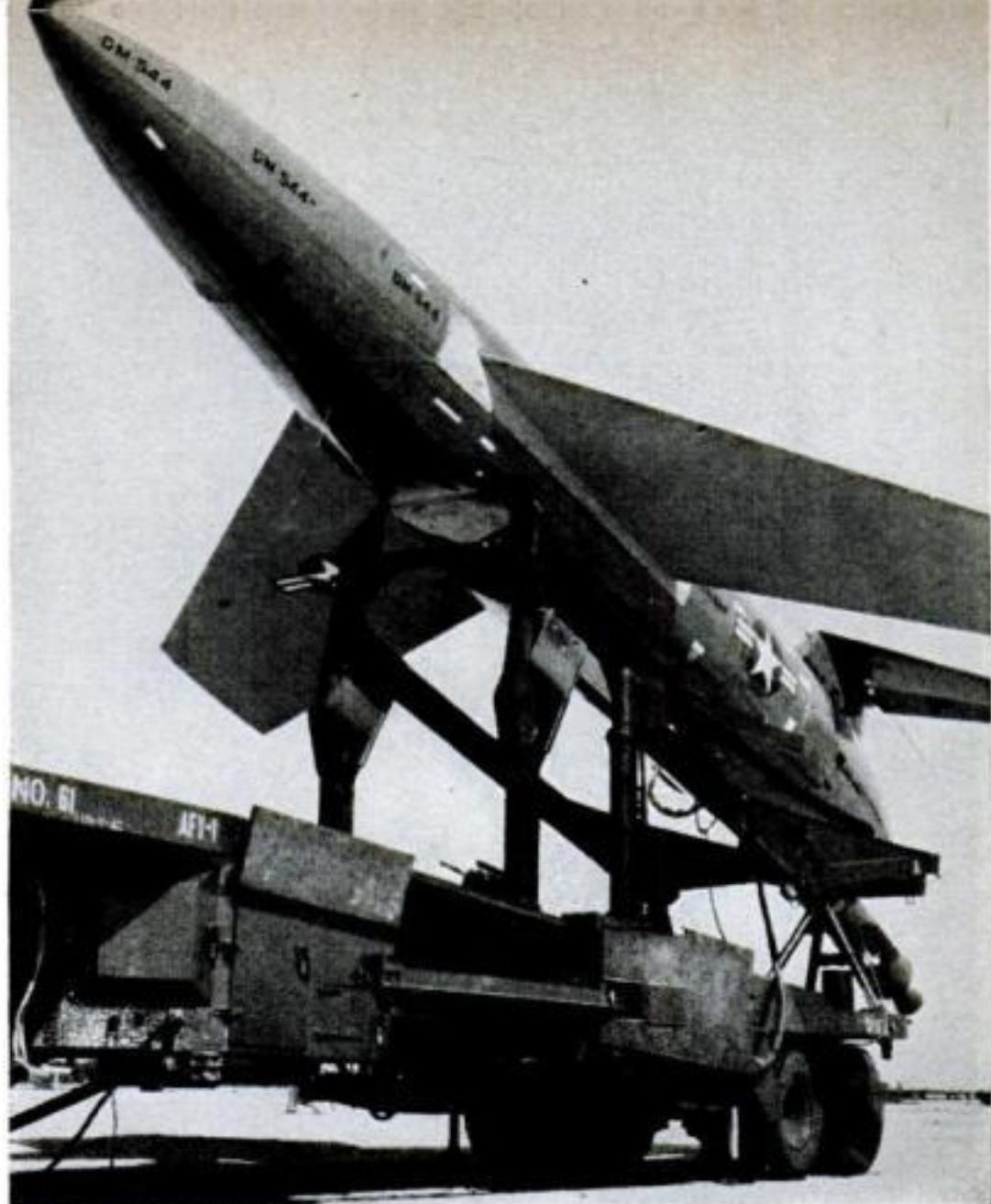
Collins worked at almost every job connected with pipe-lining before he went into construction with his own company. Now he has been plunged into big business by the successful completion of the seagoing line. All kinds of underwater pipe-line problems are dumped on his desk. Three machine shops work full-time turning out equipment for his projects. Collins is one man who has gone up by going down. **END**

Pilotless Bomber Can Carry A-Bomb at 700 M.P.H.

THESE pictures document a big step toward push-button war. They show the launching and flight of America's hitherto secret B-61—nicknamed the Matador—a pilotless jet big enough to carry an atomic warhead. In taking the wraps off it, the Air Force also announced formation of its first pilotless-bomber squadron, which will soon start training with the new tactical weapon.

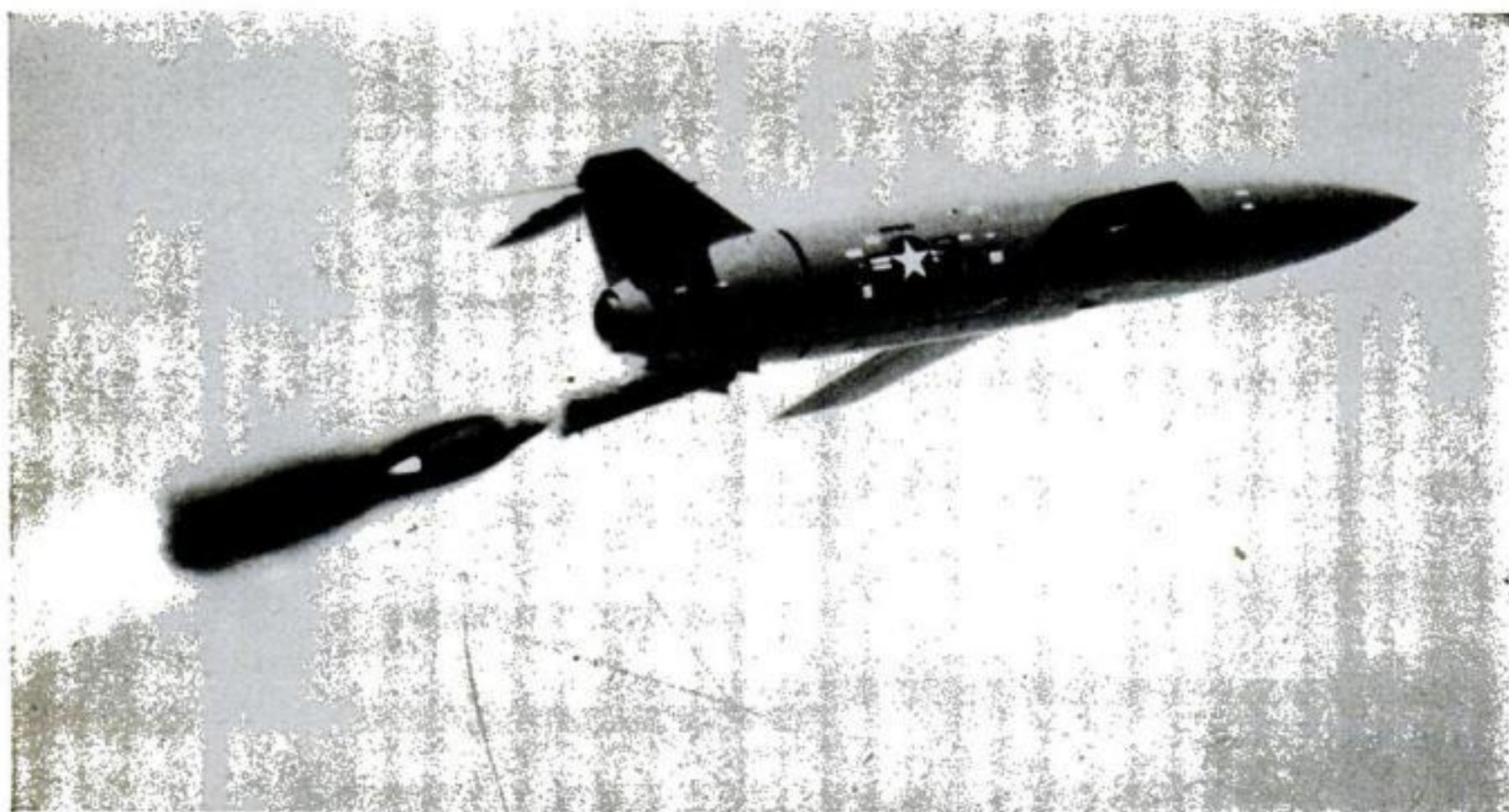
The Matador, made by the Glenn L. Martin Co. of Baltimore, is guided by radio to its target at around 700 miles an hour. No known jet fighter could catch it and shoot it down. And, having no crew, it would not have to fly at high altitude to escape the A-bomb's terrific blast.

The guided missile's range, however, is limited by the reach of its controlling ground radio—probably a few hundred miles. This might be extended by guiding it from a "mother" plane, which could stand off at a safe distance while the missile closed on its target.

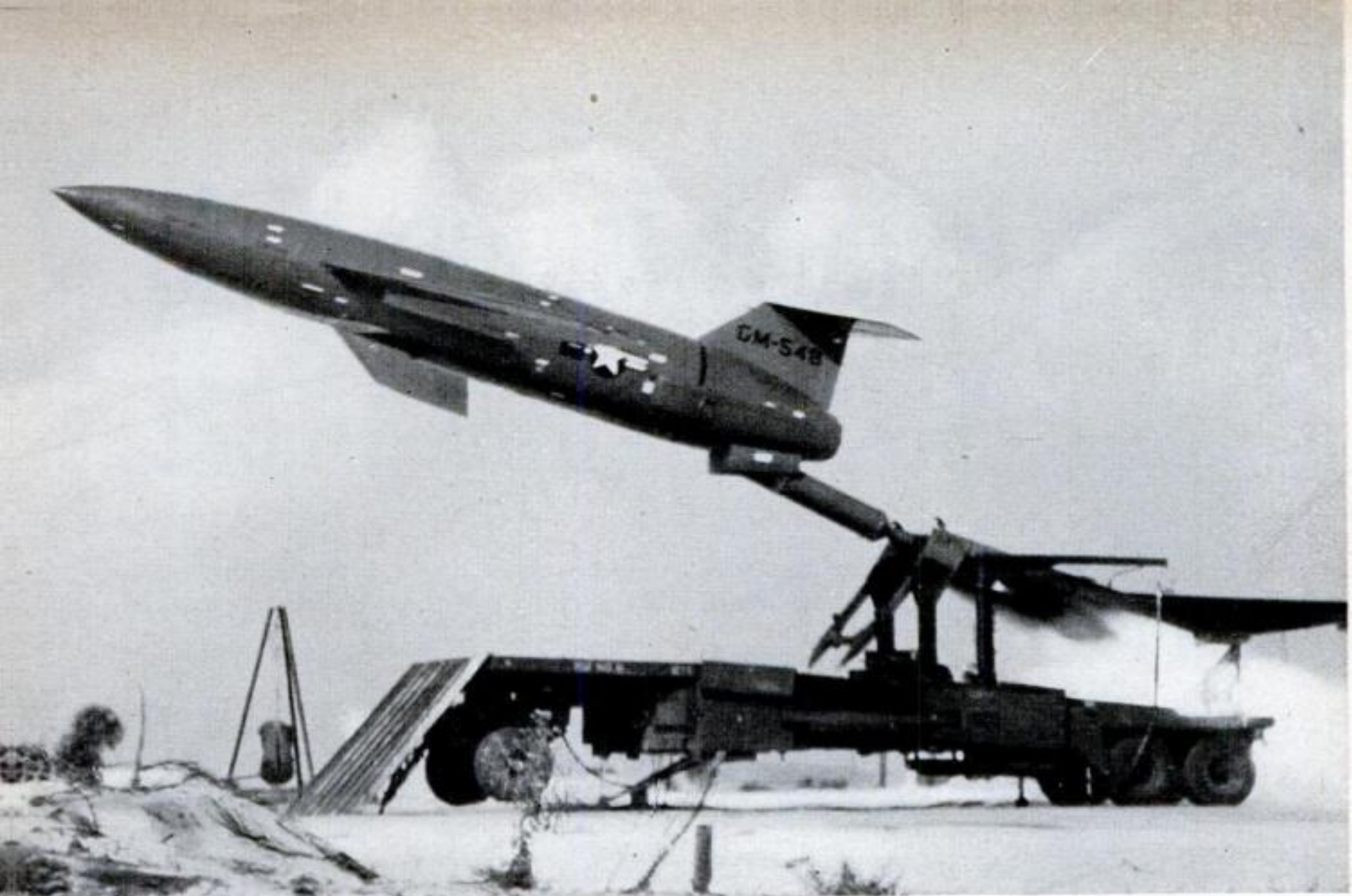


Matador awaits take-off from its launcher.

The First Pilotless Bomber Squadron (Light), equipped with B-61's, was activated last month at the Air Force's Missile Test Center in Cocoa, Fla. Later it will work under the Tactical Air Command. Its formation followed reports that the U.S. has developed a small A-bomb suited to use against armies in the field.



As missile gains speed, spent rocket bottle starts to drop off. Note fat body and needle nose.



Missile leaves ramp in fiery blast from auxiliary booster rocket slung underneath its tail.



As booster rocket falls off, jet takes over, and missile speeds to keep date with destruction.



Parking Meters Yield \$50,000,000 a Year

Irate motorists have tried to chop them down, jam them with gum, fool them with slugs. Yet their number grows.

By DeWitt Reddick

IN THE short space of 15 years the parking meter has swept the continent to become an American institution. Meters now confront the motorist in 90 percent of U. S. cities above 50,000 in population, and yield an annual income of approximately \$50,000,000 to city governments. At a nickel an hour, the standard rate, this means that American drivers are buying more than 1,000 million hours a year for parking.

The parking-meter business is a postwar baby. Now the industry spreads an annual sale of about \$15,000,000 among six major companies and a few minor ones. Competition is rough, and the industry still struggles with problems uniquely its own.

"Vigilantes" Arrive with Axes

For instance, few industries face such sharp resentment from the people they aim to serve. It has been almost universally true—and still is—that the first wave of parking meters installed in a town arouses citizens to impressive wrath.

In Mobile, when meters were installed in 1935 on a trial basis, a "vigilante" committee showed up with axes to chop them down. Carthage, Tex., city officials agreed to install meters in the business section; but when the crew began to put them around the courthouse the sheriff chased them away with a shotgun. And one indignant motorist in North Dakota got an aroused public to outlaw meters in 1948. They were made legal again this year. Undaunted, the angry man has secured 10,000 signatures to a petition to outlaw them again.

After the initial shock most communities accept the meters as an inevitable sign of progress. By now approximately one million meters have been installed in 2,500 cities. Installations range from Culpepper, Va., which started with 12 meters, to Chicago, with 15,000. New York City has just installed some on a trial basis. Geographically, they spread from Brownsville, Tex., to Fairbanks, Alaska.

A city does not have to spend money to install meters. If the city agrees to try them out, the parking-meter company sends a crew to sink holes through the sidewalks and do all the other work. Then comes a six months' trial period. The city gets half the revenue and the other half goes in payment on the meters, which retail (according to make) from \$60 to \$75 each. At the end of the trial period the city decides whether or not to keep the meters. If the decision is no, the city keeps its half of the revenue already collected, while the company must remove the meters and repair the sidewalks.

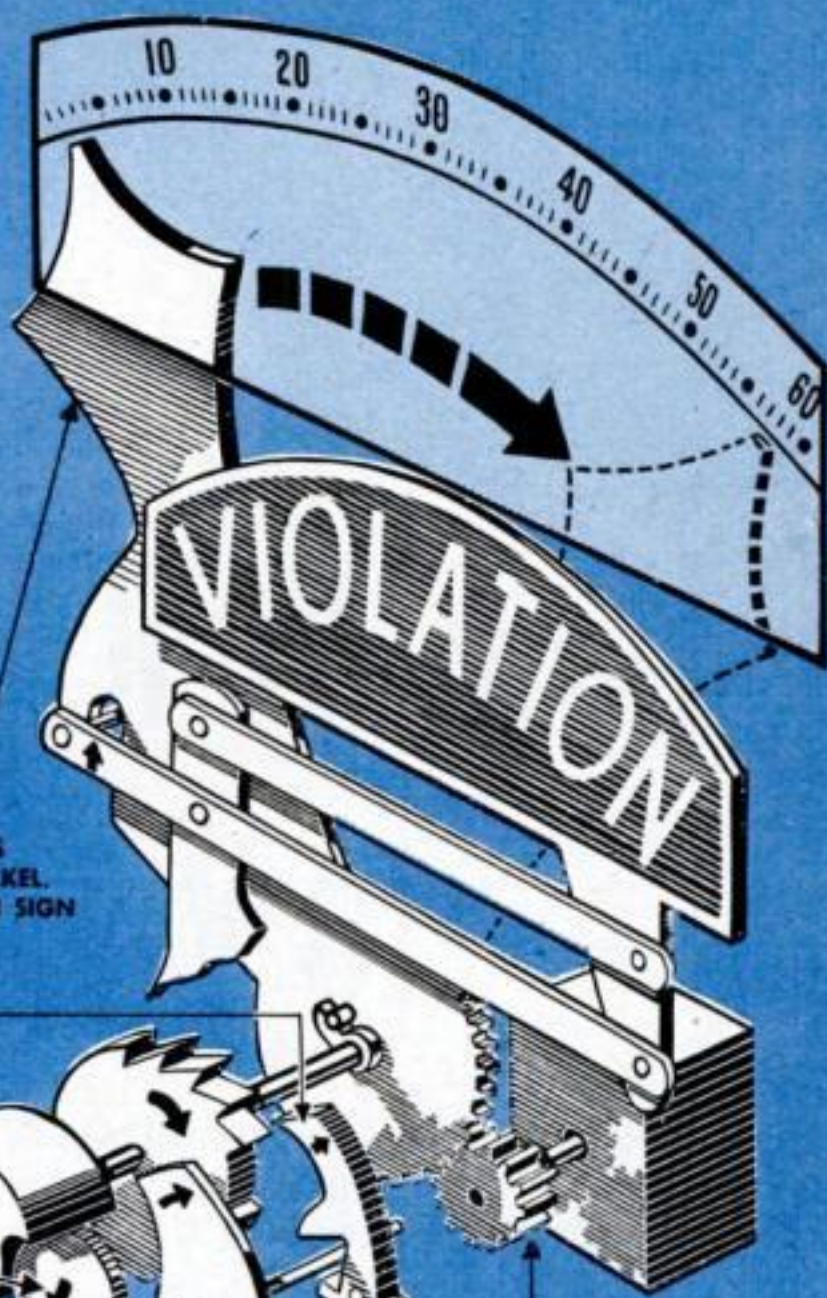
Local Parkers Grab Places

The parking meter was invented to help solve the traffic snarl which constitutes a major problem for most cities. Surveys in the 1930s indicated that a major proportion of downtown parking space was filled with cars of those who worked in the vicinity. Little space was left for customers. Likewise it was shown that the same cars remained parked all day, despite one-hour parking zones. A wet cloth quickly removed chalk marks used by a passing policeman to check parked cars. Regular checkups were difficult to maintain. Busi-



"Violation" sign at window shows cop no parking time has been paid for, or that time has run out. It's raised by pantograph when pointer swings back to zero.

How a Parking Meter Works



4 POINTER SWINGS OVER TO FIGURE SHOWING PARKING TIME PAID FOR: 12 MINUTES FOR EACH PENNY OR AN HOUR FOR A NICKEL. POINTER'S MOVEMENT LOWERS VIOLATION SIGN

3 ROD RAISES SECOND PAWL TO CLEAR ALL TEETH ON RATCHET. IF PENNIES WERE USED, THEIR SMALLER DIAMETER WOULD RAISE THIS PAWL ONLY ENOUGH TO CLEAR ONE TOOTH FOR EACH PENNY

2 NICKEL ACTS AS CAM EXTENSION, PUSHING LOCKING PAWL ASIDE AND PERMITTING CAM TO TURN

1 AFTER INSERTING COIN, MOTORIST TURNS HANDLE

5 AS POINTER SWINGS OVER, GEARS WIND CLOCK THAT WILL MOVE IT BACK

6 WHEN HANDLE IS RELEASED, PREVIOUS COIN DROPS INTO COLLECTION BOX

How meter gulps money is shown in sketch of Mi-Co Meter. Some take only nickels or dimes.

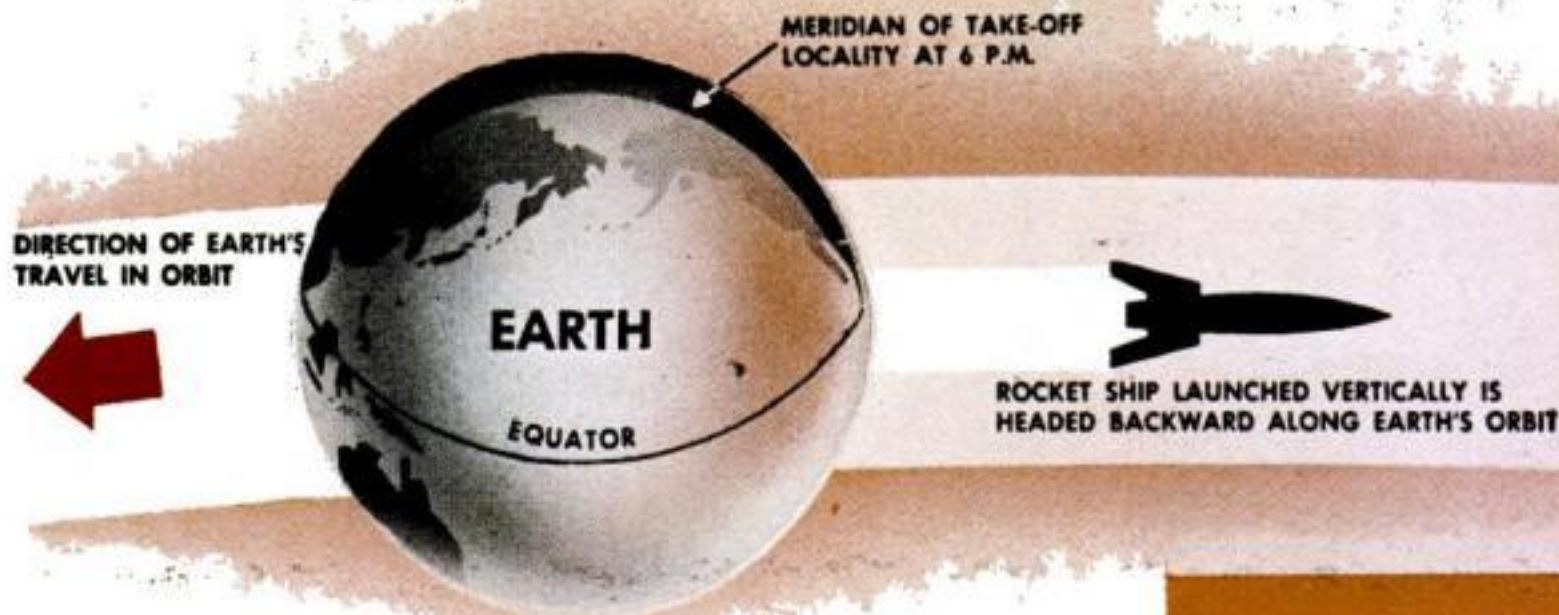
ness flowed to suburban shopping centers.

Parking meters, while not the entire answer, have afforded notable relief. After installation of meters, Washington, D. C., reported parking turnover at least 25 percent greater. Dallas surveys showed four times the number of motorists using downtown parking space as before the meters. Wilmington, Del., officials stated: "There

are only 440 parking meters in Wilmington's central business district, but 5,500 cars park daily in the metered area."

Carl W. Magee, then editor of the *Oklahoma City Daily News*, is credited with originating the idea for the present form of parking meter. In the late 1920s, when he was a member of the traffic committee

[Continued on page 294]



How We'll Fly to Venus

An aviation engineer submits a flight plan for navigating a spaceship to our nearest neighbor among the planets.

THE first flight to Venus will depart from Earth shortly before 6 P. M.

The date has not been set. It could not be revealed now, even if it were known, because it would indicate how rapidly guided missiles are being improved.

But the time of day can be forecast.

John M. Wuerth, an engineer in North American Aviation's electromechanical department at Downey, Calif., has done so by working out the navigational problem which the first men to fly to Venus will have to solve. He has submitted a "flight plan to Venus" to the Institute of Navigation.

Venus comes closer to the Earth than any other planet, so it is likely to be the first one that men will try to visit. At times, it is only 25,000,000 miles away. (Mars is always at least 35,000,000 miles away.) Venus, moreover, is a planet that probably could sustain human life. There may, in fact, be living creatures on it now.

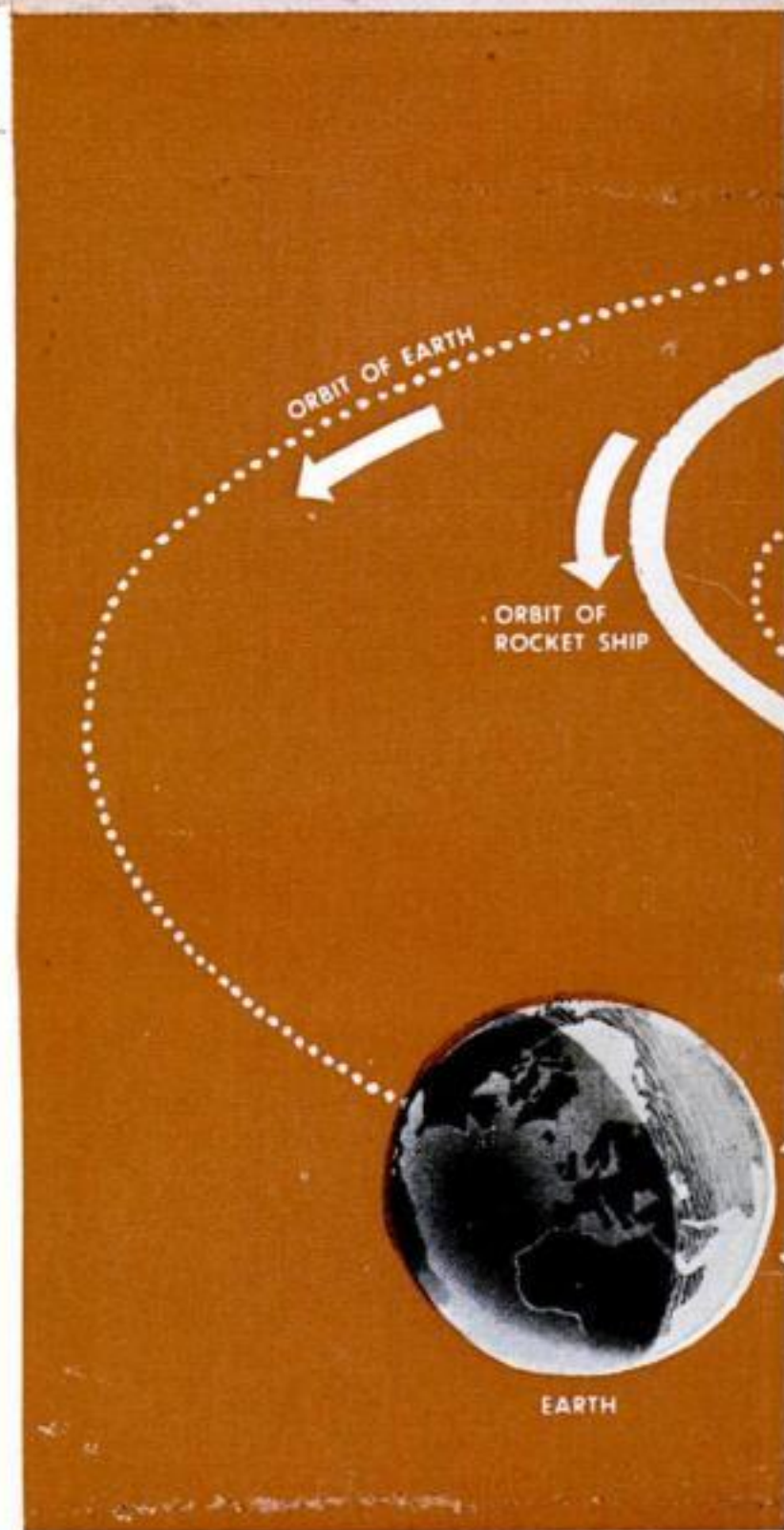
In ordinary navigation, you determine your position by shooting the stars and correct your course as you go along. But getting

to Venus from the Earth will be like being shot out of a gun.

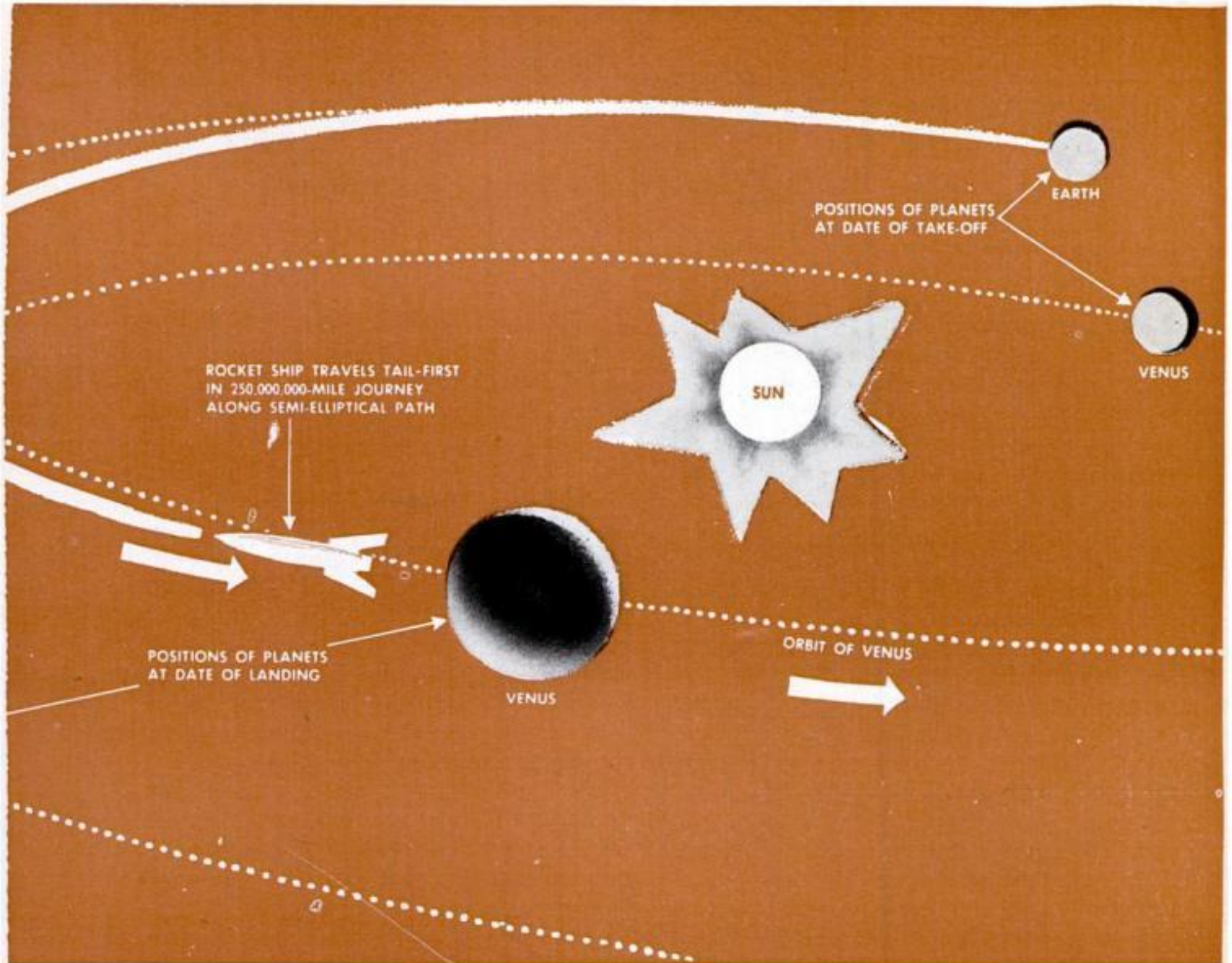
The Start Is All-Important

Once your rocket ship is well out into space, you will not be able to change your course whenever you please. Your steering will have to be done during the first few minutes of the voyage. For rocket fuel, precious because of limited carrying capacity, will be expended only for taking off and landing.

Motive power for the major part of the



Here are highlights of the way a rocket spaceship could be navigated from Earth to Venus. Take-off from Earth at about six P.M., left, would head ship in desired direction—backward along Earth's orbit. Ship would still be tagging after Earth, tail-first and at slower speed. Result is seen in larger view below. Pull of sun's gravity would draw ship into semi-elliptical path toward orbit of Venus, which would be reached in 146 days. Meanwhile Venus would have traveled in its own orbit more than halfway around sun. Curving 250,000,000-mile route is more economical of fuel than short, direct one.



journey, as Wuerth sees it, will be furnished by the pull of the sun's gravity. Here is his explanation:

The Earth whizzes along its orbit around the sun at 66,600 m.p.h. At this speed, it is as firmly tethered in space as if it were whirling on a string. The inward pull of the sun's gravity is exactly balanced by the outward pull of centrifugal force. A rocket ship, or any other object, traveling at Earth's speed in Earth's orbit, would likewise stay put there.

Suppose that you fired a 66,600-m.p.h.

rocket backward from the Earth along its orbit. This would be like firing a bullet backward from a plane flying forward at the same velocity. The bullet, obviously, would stand still in mid-air, then fall vertically under the pull of gravity.

A rocket fired backward from the Earth at the same velocity as the Earth would stand still similarly, then fall similarly. But in this case the gravity that caused it to fall would be that of the sun, so it would fall toward the sun and thus into the orbit of Venus.

Actually, to hitchhike a ride on the sun's

Will living Venusians be found by first space travelers from Earth? Grasshopper-like people with jet-propulsion outfits on backs tend a Venusian garden in this fanciful drawing by North American Aviation artist. Scientists say life on planet is possible—and there's virtually nothing to limit imagination as to its form. Clouds hide face of Venus and prevent observation of it.



gravity, a rocket would not have to come to a full stop in space. If the bullet in our analogy had less speed than the plane from which it was shot, it still would fall—but this time, in a curved trajectory. So would a rocket that was traveling back less rapidly than the earth moves forward.

To Escape from Earth

This enables Wuerth to base his plan upon a rocket ship of lower speed, more economical of fuel, than 66,600 m.p.h.

A take-off time of about 6 P. M. will launch it vertically in the right direction. The point of departure will be somewhere along the equator. At that hour and latitude, "up" will be straight back along the Earth's orbit.

For 13 minutes, the rocket he envisages will hurtle straight upward at ever-increasing velocity. In that time it will reach a height of 2,000 miles and a speed of 17,500 m.p.h.—enough, at that altitude, to free it from the apron strings of Mother Earth's gravity.

Venus Will Move, Too

The space crew then will cut off the rocket power, and let the ship coast onward. Although its speed with respect to Earth will drop to 5,400 m.p.h., Wuerth's figures indicate, it will begin to respond to the pull of the sun, leave the Earth's orbit and curve inward toward the orbit of Venus.

It will then glide for 250,000,000 miles on a semi-elliptical course that will lead to

Venus. As it advances, the ship will gain speed as a natural consequence of the sun's gravitational attraction—and it will reach Venus 146 days after leaving the Earth.

In this time, almost five months, Venus will have journeyed in its own orbit more than halfway around the sun. Allowance will have been made for this, of course, by choosing a take-off date that will permit the spaceship to reach the orbit of Venus at the right time. Such a favorable relative position of Earth and Venus occurs only once in 19 months—making daily or weekly cruises to Venus unlikely in the foreseeable future.

Preflight plans will also take into account the Earth's rotation upon its own axis. This gives Earth's surface at the equator a tangential velocity of more than 1,000 m.p.h. which will be imparted to the rocket at the time of take-off, in a direction sideward to its desired course. To counteract this effect, Wuerth says, it will be necessary to take off slightly before six P. M.

Aim Depends on Speed

Most critically of all, success in intercepting Venus will depend upon the exact velocity of the accelerating spaceship at the instant of power cutoff.

If this "cutoff velocity" is too high, net orbital speed will be lower than intended. Then the rocket ship will be drawn too rapidly toward the sun and will hit the orbit of Venus too soon, missing connections and passing between Venus and the sun. Conversely, too low a cutoff velocity will result

in too high a net orbital speed, and the rocket ship will overshoot its mark, again missing connections.

Naval airmen know how it feels to rendezvous with a carrier, the only possible landing place in a vast expanse of inhospitable ocean. Here you will be trying for a touchdown hundreds of millions of miles away. If you're 10 minutes late, you will miss by 13,000 miles.

Near Miss Is Close Enough

Luckily that wouldn't be too serious. If you managed to come within 15,000 miles of Venus, the planet's attraction would deflect the ship in for a landing. But if the ship missed by a wider margin, only some means of turning it toward Venus could save you. Otherwise the planet's gravitational pull would merely fling the ship off into another orbit around the sun, and spell doom for the passengers and crew. The ship would circle in space forever, or until it collided with another planet.

So the most important navigational instrument will be an accelerometer, to measure the rate of speed increase during powered flight. The Germans used one to determine the proper power-cutoff point for their deadly V-2 rocket. To get within the required 15,000 miles of Venus, cutoff speed

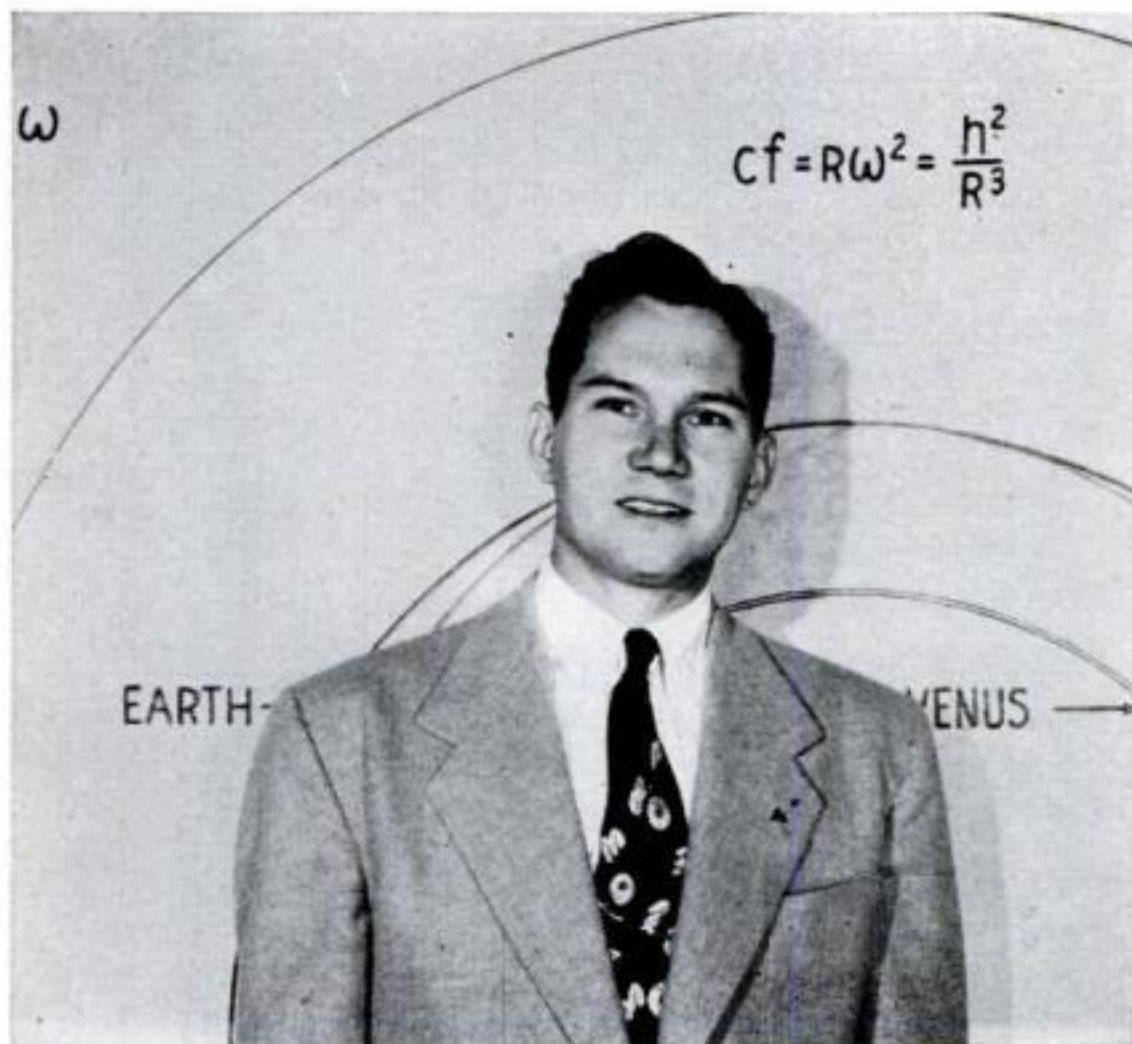
should be accurate to within .007 percent. With present instruments, inaccurate by as much as .1 percent, a ship could miss Venus by a million miles. But, Wuerth says, "It's not unreasonable to assume that an accelerometer accurate within .0035-percent error will be ready before our take-off."

Getting Home Again

How will the ship land on Venus, and how will you return to Earth? Rocket brakes should ease you down. But to get back home you would need enough fuel for the round trip—and enough food to last until Venus and Earth "lined up" properly for a return voyage.

In returning, you would get the needed boost by taking off in the direction of Venus' orbital travel. Rocket speed would then be added to the planet's, instead of subtracted from it—and the pull of the sun's gravity upon the rocket ship would be exceeded by centrifugal force, which would propel the ship homeward.

Other interplanetary voyages can follow the same principles, Wuerth foresees. Alter the Venus flight plan, for example, by taking off at dawn instead of dusk, and centrifugal force would hurl you into Mars' orbit. You would reach the red planet 237 days later. END



"Flight plan to Venus" in diagram form provides background in this photo of its author, John M. Wuerth, North American Aviation project engineer. Formula gives some of data.

KEY FIGURES IN FLIGHT PLAN TO VENUS

(Data given in round numbers for simplicity)

Orbit of Earth, radius.....	93,000,000 miles
Orbit of Venus, radius.....	67,000,000 miles
Distance from Earth to Venus:	
At nearest approach.....	25,000,000 miles
By semi-elliptical flight path....	250,000,000 miles
Orbital speed of Earth.....	66,600 m.p.h.

PROPOSED FLIGHT SCHEDULE:

Departure time.....	Shortly before 6 P.M.
Accelerating period:	
Duration.....	13 minutes
Altitude reached.....	2,000 miles
Cutoff speed (relative to Earth)....	17,500 m.p.h.
Total time for journey to Venus.....	146 days

P.S.

Last minute news & notes...

A DETAILED PROPHECY of the future by a scientist as eminent as Dr. James Bryant Conant, Harvard University president, is a rare and newsworthy event. He has gazed into his "crystal ball," he recently told the Diamond Jubilee meeting of the American Chemical Society-- "to be sure, a plastic one, as befits a chemical age." And here is what he sees ahead in the next 50 years: SOLAR ENERGY will become "the dominating factor in the production of industrial power" by the end of the century . . . DISTILLING FRESH WATER

from the sea, by running modern compression stills on cheap and inexhaustible solar power, will turn nearby deserts into garden spots . . . COAL will be

gasified underground, and cheap farm crops converted into gas, to manufacture fuels and chemicals . . . BEER, wine and spirits will be made en-

tirely from synthetic alcohol, with flavor added by a minor fermentation . . . THE ATOMIC AGE will have

brought about neither a "holocaust" nor "golden abundance." Among many factors limiting use of atomic power will be "gigantic problems" of disposing safely of radioactive wastes . . . WORLD WAR III will have been

averted, although "by the narrowest of margins," by the free world's armed strength. New York and other great cities will still be standing, unscathed by bombs. And despite "grim years" just ahead, the next half century may yet prove "a period of gradual disarmament and peace."



DRAMATIC CURES of meningitis cases within six days are reported with the new wonder drug, terramycin.

TINLESS "TIN CANS" are ready for production to conserve the strategic imported metal. Two substitute materials developed by Reynolds Metals Company: Heavy aluminum foil coated with plastic; and "aluminized steel," made by rolling steel between aluminum-foil layers that become firmly bonded coatings.

THE LINCOLN CONTINENTAL design that car fans rate so high (see p. 161) may reappear, after some 10 years' absence, on '52 Lincolns, one Detroit rumor says.

COLORED DUCKLINGS--red, blue, pink or yellow--seen in eastern marshes needn't send unbelieving observers to the oculist. Coloring ducks' plumage, by injecting dye in their eggs, now supplements bird-banding to aid in studying the game birds' travels.

PAPER RUGS are one result of mixing synthetic neoprene rubber with paper pulp--an idea perfected by du Pont after spending three years and nearly \$1,000,000 on research. Rugs woven of the rubberized paper are said to be long-wearing, washable.

YOUR OWN EYEGLASS lens can be fitted into a new eyepiece for one imported camera. It is available as accessory for the Exakta V, distributed by Exakta Camera Co., N.Y.C.

A HIGH-SPEED GEAR CUTTER devised by a Michigan tool firm may relieve a bottleneck in defense production. It accurately cuts gears and splines four times as fast as previous single-spindle machines do, the makers say.

HONEY-COLORED RASPBERRIES come from a new hybrid variety named the Amber, developed at New York State's Agricultural Station.

A HIGH-PRESSURE PUMP of new design will work at more than 100,000 pounds to the square inch, equivalent to explosive pressures reached in the barrels of big guns.

The Editors

Lumber stacked solidly can take years to dry. After several months in a lumberyard, these

boards are still so green that moisture stands in pools on those underneath the top boards.

How to Use Green Lumber

You may save close to half the cost of a job by buying green lumber and seasoning it yourself.

By Paul Corey

HAS the price of dry lumber discouraged some of your home-repair or remodeling jobs? Go back to your lumber dealer and take a look at some of the green

stuff he has stacked in his yard. Unseasoned lumber may solve your problem.

I wanted to put a wooden ceiling in part of my house. The job called for 500 board feet of matched redwood V-joint boards.

"I've got just what you want," the lumber dealer said. "But I hate to tell you the price." I hated it, too, when I heard it. He wanted \$250 a thousand feet for clear, dry lumber.

Instead, I bought a thousand feet of No. 3 grade. It had some knots, a few splits, and it was so wet that it squirted water when you drove a nail into it.

But the price made up for that. It was an encouraging \$70.

The choice boards from it gave me my ceiling, a cash saving of \$55 and a bonus of 500 feet of lumber that I've used for basement repairs, outbuildings and other such jobs. I earned the saving and the

bonus by stacking and "sticking" the lumber to air-dry it.

How to season it. To air-dry lumber properly, the boards must be stacked in layers with the layers separated from each other by stickers—strips of seasoned wood 1" thick and 1½" to 2" wide.

Start by laying down two-by-fours on edge. Two-by-sixes are better if you have them. Set these base supports 16" to 36" apart. Place the first layer of boards to be seasoned on the base supports. Leave 1" to 3" of space between the edges of the boards. Then lay stickers on this first layer of boards. Space the stickers 48" apart.

Put the next layer of boards on the stickers. Locate each sticker above the one below and continue to build the stack. Placing the stickers one above the other will lessen warping as the lumber dries.

How to avoid checking. The little

splits that develop in the ends of boards are called checking. They occur when the ends of a board dry faster than the center. One step that you can take to reduce this waste of lumber is to paint the ends of the boards. A coat of paint will seal the ends and keep them from drying faster than the rest.

Where to air-dry lumber. The best spot is an open shed or a garage where the air can circulate freely but rain can't get in. An overhead rack like the one shown saves space. It is particularly good in a heated basement in the winter. Air near the ceiling is likely to be warmest and driest.

You can dry lumber outdoors, too, especially in the summer. After you have built the stack, cover it with a tarpaulin to keep out the rain and the direct rays of the sun.

If you don't plan to season lumber regularly, building paper makes an inexpensive substitute for a tarp.



Overhead rack provides efficient drying without stealing valuable floor space in your shop. To air-dry lumber (below) stack it with sticks between the boards to keep them from touching each other. Stack should also be covered with a tarp to keep off rain.



Building with green lumber. If you are in a hurry, there are a couple of ways of building with green lumber and letting it season after the job is finished.

With matched lumber, such as tongue-and-groove or shiplap, put up the wall in the usual fashion—but use small finishing nails. Then you will have a wall during the time the lumber is drying. After a few months you can easily take the boards down by driving the small nails right on through with a nail set or slender punch. Then put them up permanently, drawing them tightly together as you go.

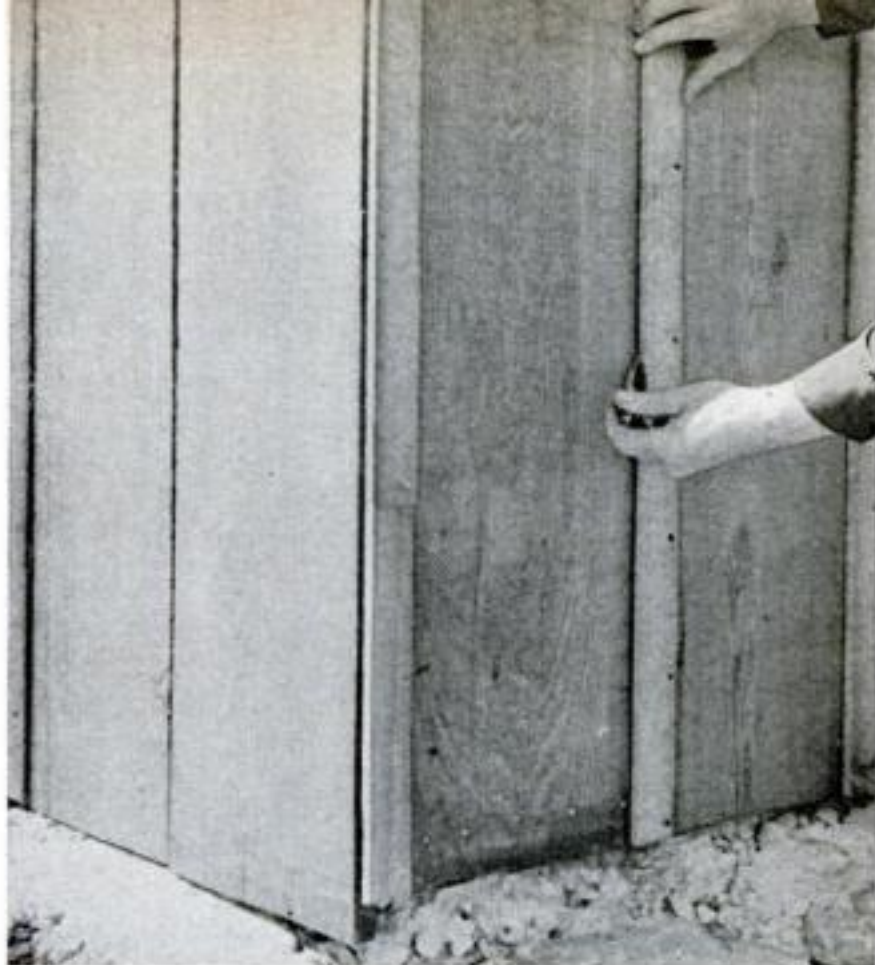
In return for your extra trouble, you get a wall at once and still end up with one fitting tightly together.

Another, and even simpler trick, works with board-and-batten construction. Just put it up in the standard way, but nail the battens along one edge only. After the boards have shrunk, complete the nailing.

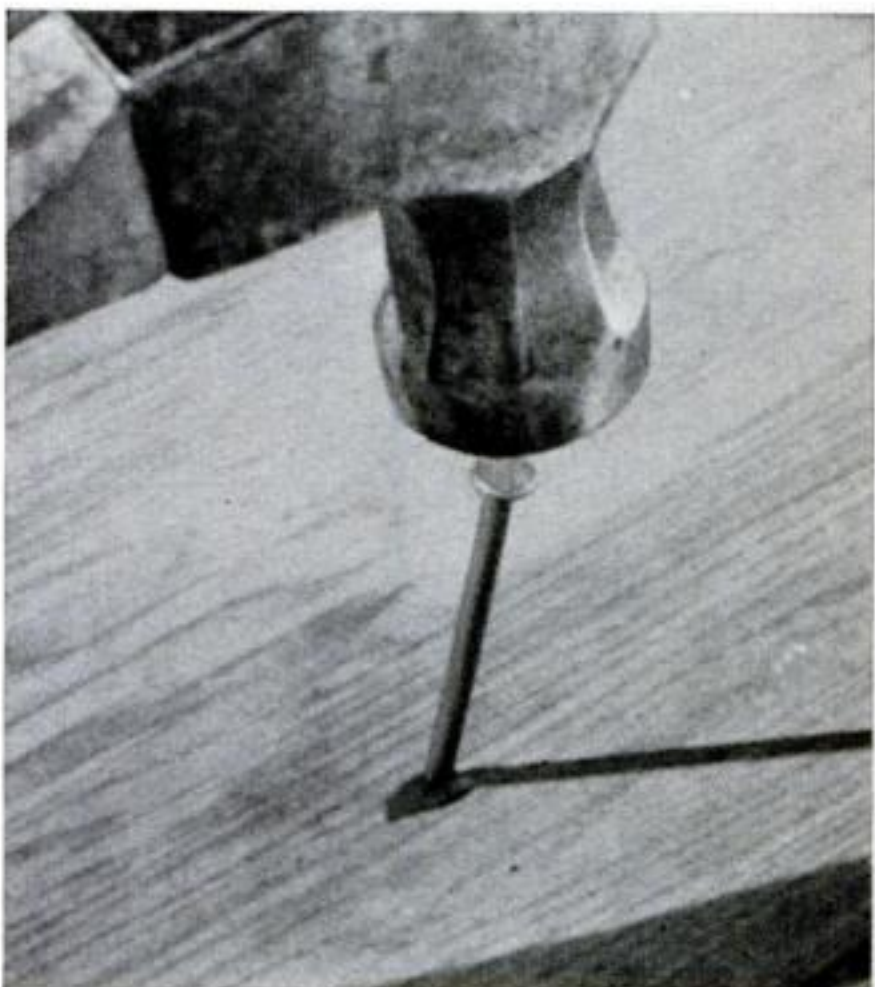
How dry should wood be? Moisture content of wood as it comes from a tree may amount to only 30 percent of the dry weight in the heartwood of some species, while the sapwood of some conifers may contain twice as much water as wood. Given enough time, wood loses or takes on moisture until its content is in balance with that of the air around it. So the ideal is lumber of the same approximate dryness as the air in which it is used. Wood used indoors usually should be drier than wood for exterior application.

How to predict shrinkage. Should you decide to build with green lumber and let it season in service, you can get a good idea of how much shrinkage to expect by a simple test. The only equipment you need is your kitchen range and a ruler.

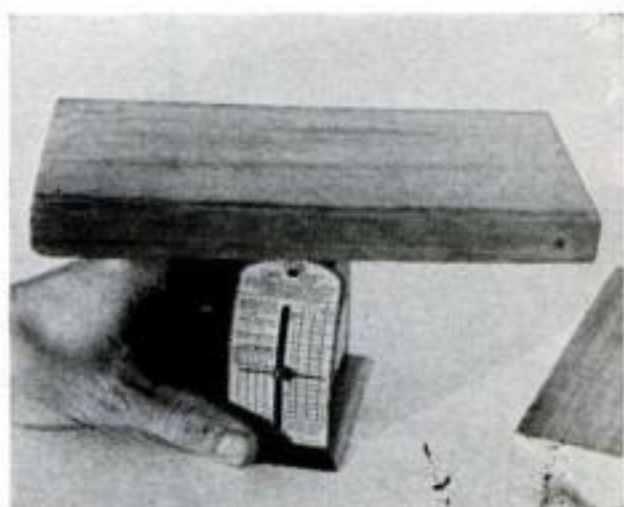
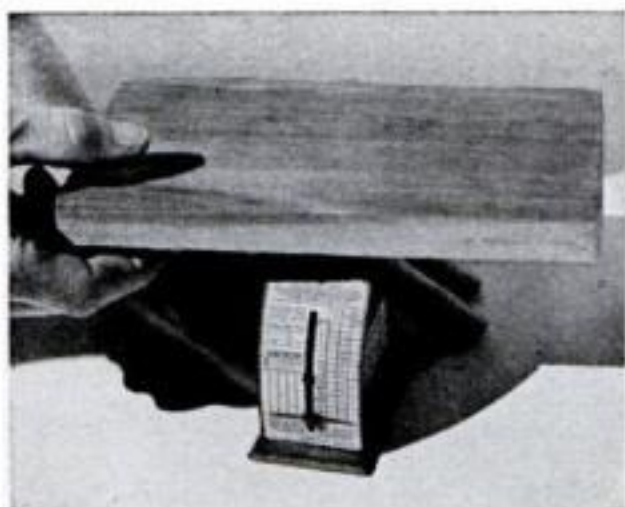
Cut a small sample of the lumber at least a foot from one end of a board. Bake it in an oven at 212° for at least four hours. Then measure it and compare it with the



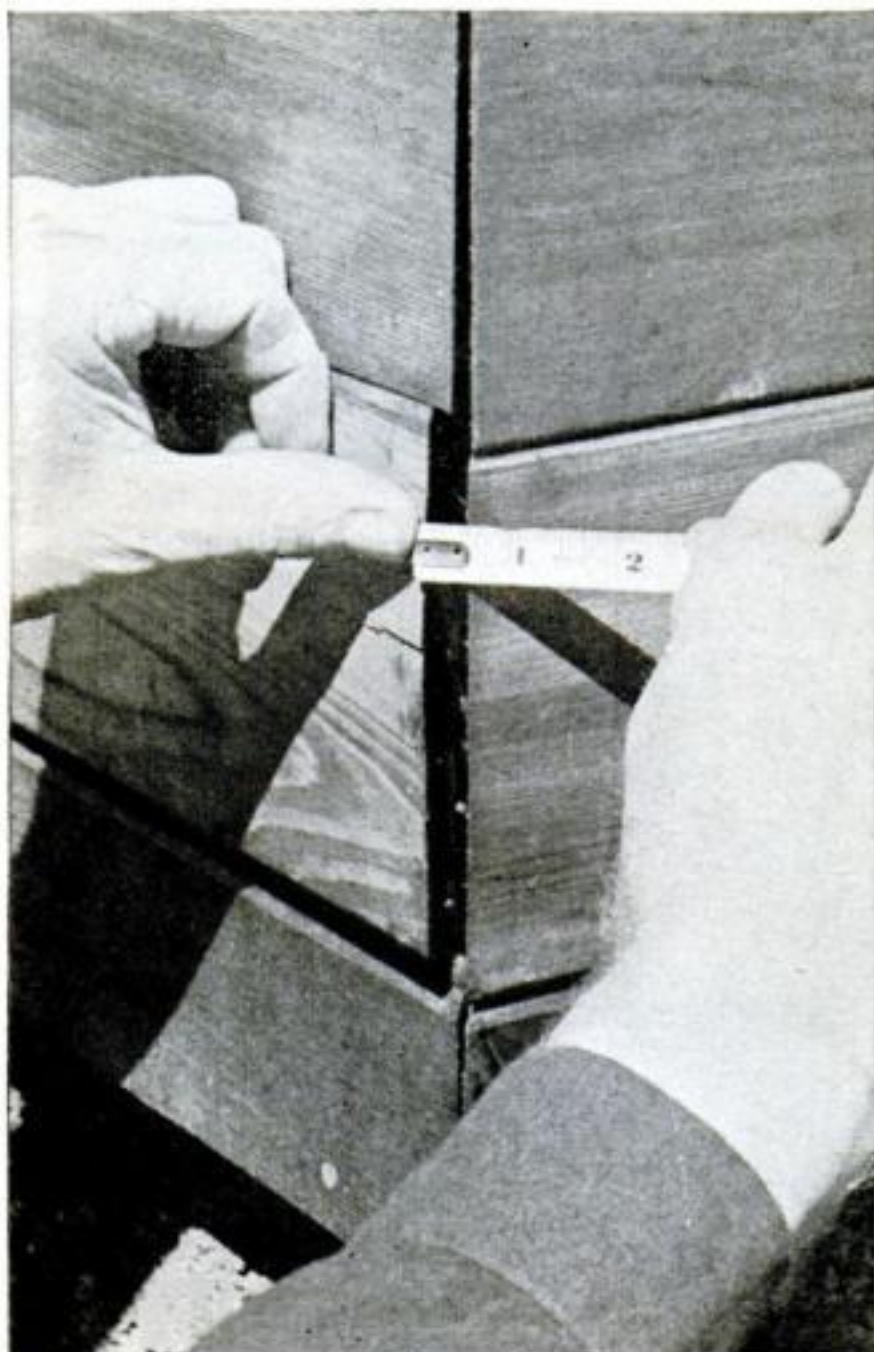
Green lumber can be seasoned on the job. Battens were nailed on one edge. After wallboards dried and shrank, other edges were nailed.



It is easy to spot green lumber. A nail driven into it will produce moisture. Board above is heart redwood, moisture content 88 percent.



Sample of wet lumber (left) weighed 16 oz. After heating it in oven, it weighed only 8½ oz.



Gaps at joints, caused by shrinkage, are result of using green lumber. You can avoid this by air-drying your lumber before using it.

undried piece that the sample was cut from.

Wood shrinks least lengthwise—along the grain. Across the grain it shrinks much more, with the greatest loss in the plane of the growth rings.

How to measure moisture. You can also run a test to check when your seasoning lumber is at its most desirable moisture content for your part of the country (see map below).

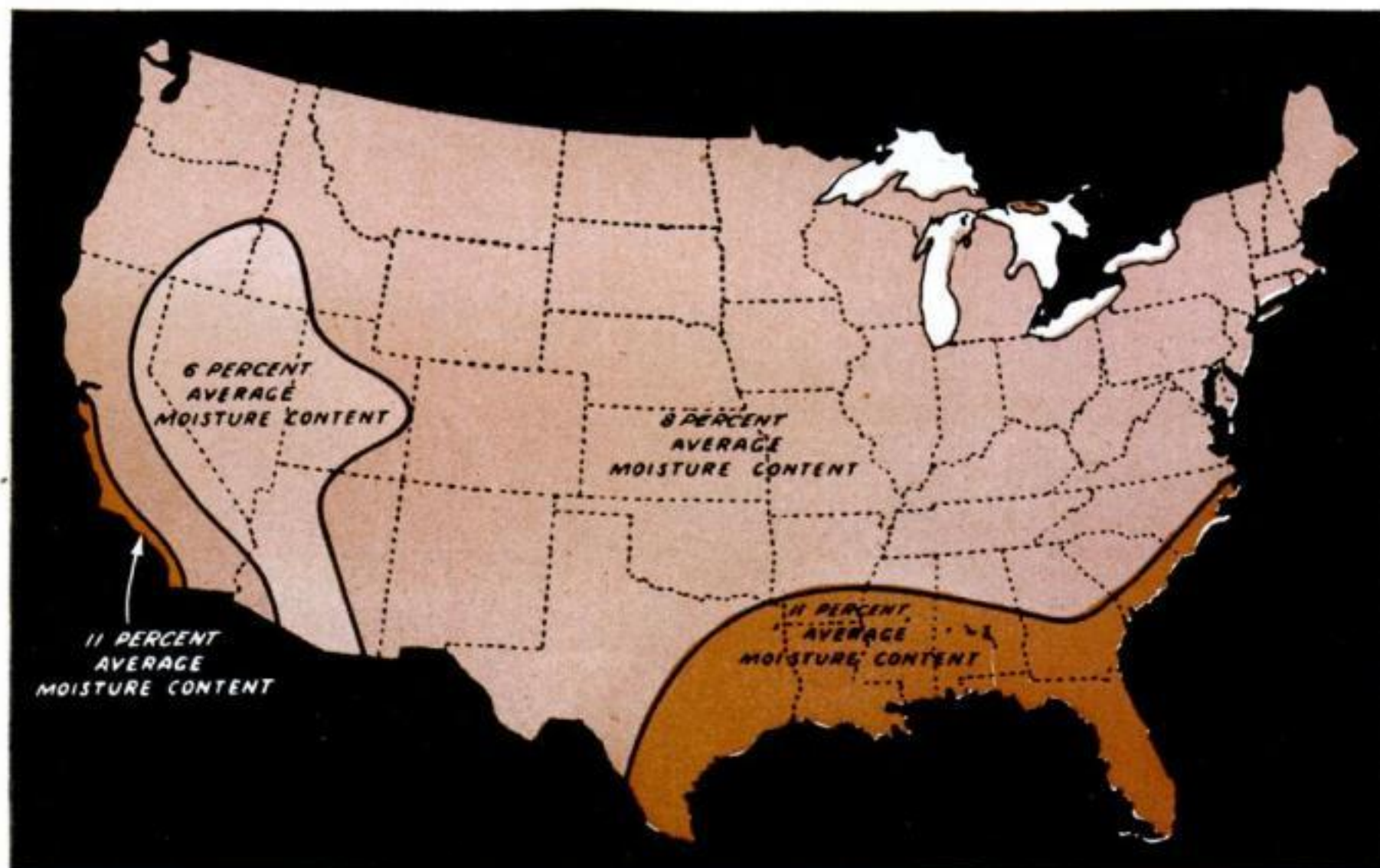
Cut another sample a foot or more from the end of a board. Use a sample that you can accurately weigh with whatever scale you have. Bake the piece in an oven at 212°. After a few hours, weigh it, and make a note of the weight. Bake it again. Weigh it again. Repeat the baking and weighing until two weighings give you the same figure.

Then subtract the dry weight from the original wet weight. Divide that figure by the dry weight.

Here's how the figures work:

The piece of 1" redwood, shown on the scale in one of the photos, weighed 16 oz. wet. After a day and a night in the oven it weighed 8½ oz. Sixteen minus 8½ is 7½. And 7½ divided by 8½ and multiplied by 100 gives moisture content as 88 percent. **END**

Next Month: How to make a planing block to cut wood with machinist's precision.



Moisture-content averages recommended for interior-finish in various areas of U.S. are shown

above. Sheathing, exterior trim, siding, framing can be about three points higher.



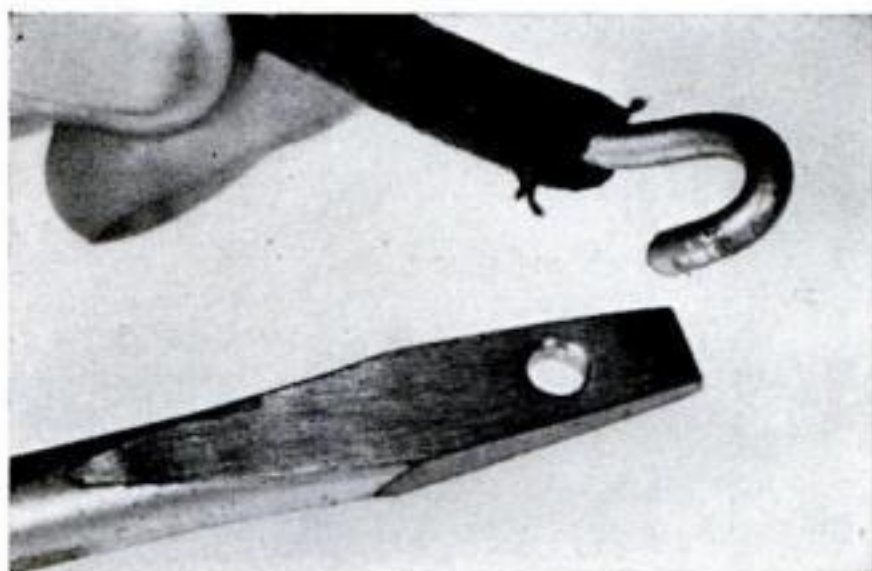
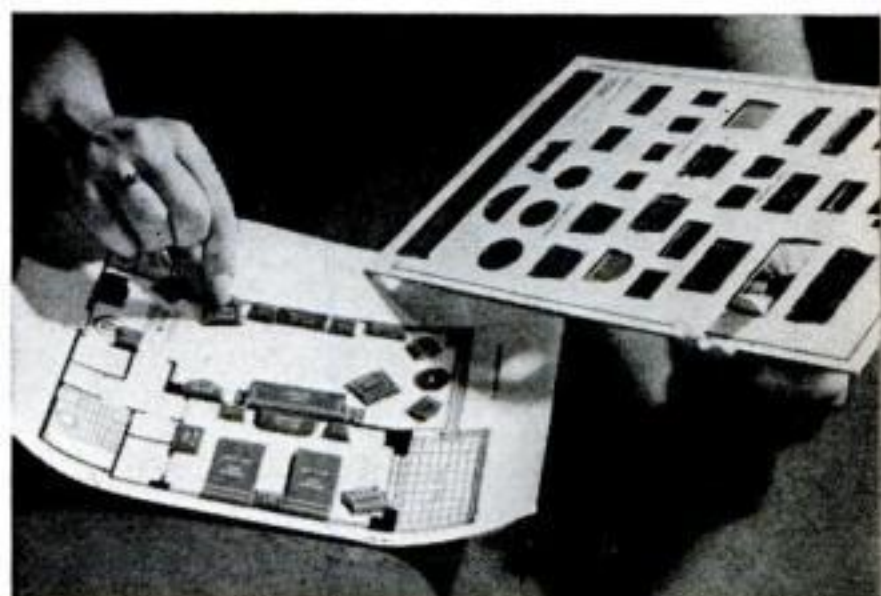
Big Trees Fail to Stump Rancher

BILL SHEPARD, manager of the Star Brand ranch near Dallas, had 6,300 acres of bottom land to clear for grazing. The bulldozer would handle brush and small trees, but he needed something more for big timber.

So the ranch shop built a bumper of 4" pipe. Attached to the 'dozer by quick-pull pins, it hits the trees 12' above the ground, toppling big trees with a single push. —Elmer Weaver, Chicago.

Arrange Furniture on Plan

It's hard to tell how furniture will fit in a new setting, so one real-estate company gives prospective tenants the apartment floor plan and a set of furniture cut outs drawn to scale. With the pieces arranged on the plan, the prospective tenant can tell at a glance how the baby grand fits in and whether he will need that oversize credenza. Called Min-U-Teriors, the cut outs may soon be made available by Bing & Bing, New York City, to other firms.



Screwdriver Curls Wire

CURLING the end of a piece of wire to make the hook that holds it securely around a screw terminal is easy with this screwdriver. Designed especially for electricians, it has a hole in the blade to form the wire hook quickly. It is made by the ALBX Manufacturing Company, Rockford, Ill.

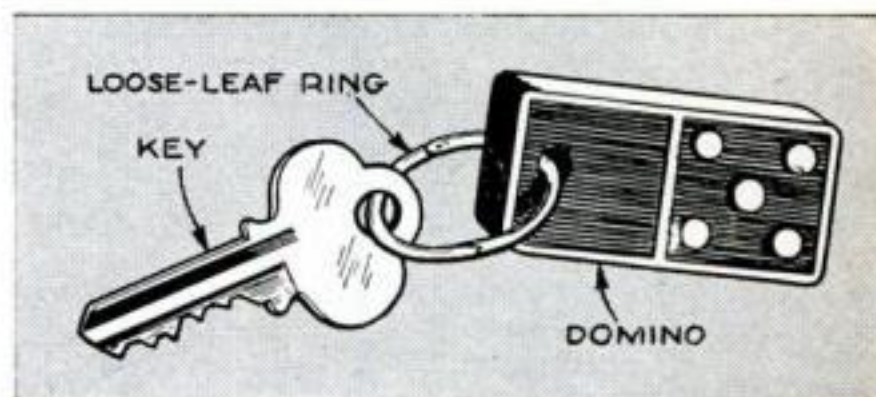
Rubber Tubing Starts Screw



A LENGTH of windshield-wiper hose is handy for starting screws in hard-to-reach places. Press the head of the screw into the tubing, turn to start the threads in the hole, then pull off the hose and use a screwdriver. —L. Shepard, Toledo.

Keys Identified by Dominoes

DOMINOES you're not using any more make good key holders—the number of dots helps you identify each key. Drill a hole in the domino and insert a hinged ring of the type used in loose-leaf binders. —Frank Shore, Manhattan, N. Y.



Saving Heat and Money

Does the heat you pay for leak out of the house?



Few houses are as tight as they could be. If yours leaks heat, you'll have to pay for heating part of the outdoors. Here's how to keep heat in:

- ☐ **Storm windows.** Make sure they fit tightly, and get them up early. Storm sash on basement windows help too. Heat kept in basement makes whole house warmer, but don't make basement too tight. Burning any fuel requires air.
- ☐ **Storm doors.** Like a single window, a single door transmits heat to outside. Even better than ordinary storm door is an outer vestibule.
- ☐ **Automatic door closers.** You can't expect to save money if doors stand open. Automatic closers will pay if children run in and out.
- ☐ **Insulation.** In the attic it acts just like a blanket. Insulating the walls is more difficult, but it pays. Insulation is needed too in walls that adjoin unheated parts of a home, such as an attached garage. A floor over a crawl space will stay warmer if insulated.
- ☐ **Weather stripping.** Cracks around doors and windows let heat escape and cause drafts. Masking tape over cracks may help even if windows are weather-stripped. Changing the position of window locks will often make the windows close more snugly and keep out drafts.
- ☐ **Calking.** Use the compound to close up openings around window and door frames.
- ☐ **A finished attic.** Close up cracks under the eaves, finish off the space with insulating board, and you'll note the difference. A tight roof keeps heat in, rain out.

Does your family have good heat-saving habits?



WHAT you and members of your family do or don't do may send your heating costs soaring. Carelessness can rob the bank account. Keep these points in mind:

- ☐ **Reduce the temperature.** Health authorities say 70° is warm enough. Cut it 5° or 10° below that while you sleep or if you'll be away from home all day. Set the thermostat at 55° if you're going away several days.
- ☐ **If you sleep with open windows,** turn off all heat in the room and close the door.
- ☐ **Fill the humidifiers.** Proper humidity will reduce the temperature you need for comfort.
- ☐ **Close fireplace damper** when there's no fire. A chimney sucks out heat as well as smoke.
- ☐ **Pull the shades and close curtains** when sun goes down. This forms air space to keep in heat.
- ☐ **Close up unused rooms.** If possible, turn off the heat at the basement. Be sure doors to such rooms close tightly. Seal the space underneath with a rug or weather stripping.
- ☐ **Ventilate properly.** Close a room and turn off the heat to it for several hours before opening the windows to ventilate the room.
- ☐ **Watch the vents in storm sash.** If yours have vents, remember that leaving them open sharply cuts their insulating value.
- ☐ **Don't overheat a garage.** Most cars will start all right if the garage is only 40°. Be sure to close the doors of a heated garage.

Don't invite Old Man Winter to your housewarming this year. Check these points and save fuel.

Was your thermostat put in the right spot?



A THERMOSTAT is sensitive only to temperature in its immediate vicinity. For that reason its location is very important. Is yours . . .

- ☐ **Too high or too low** on the wall? You sacrifice efficiency if it is. Five feet above the floor is just about right for a comfortable temperature.
- ☐ **In a draft?** Even if it's located in the current that normally comes down a stairway, it will call for more heat than a home needs. Also be sure that cold air from a frequently opened door doesn't strike it.
- ☐ **On an outside wall?** If so, it will call for too much heat. An inside-wall location is always best. But be sure the adjoining room is heated. Even a cold inside wall would affect it.
- ☐ **Too near a source of heat?** A radiator, register, range, fireplace or even a lamp may cause the thermostat to turn off too soon. Because house is cool, you'll keep turning up the heat, usually so much that heat will be wasted.
- ☐ **In the wrong room?** For example, if you do most of your inactive sitting in a den, the living room is no place for the thermostat. The den is the room you want comfortable.
- ☐ **In good working order?** A thermostat that lets temperature fall several degrees before calling for heat adds to fuel costs and detracts from comfort. A new one may be best. If temperature setting on thermostat face doesn't correspond with thermometer, have it calibrated. Clean dust off electrical contacts, but do not use sandpaper on them.

Is your heating system working efficiently?



THERE are chances of waste or loss all the way from the bin or tank to the tip of the chimney or the remotest radiator or register. Here's what to look for:

- ☐ **Chimney** should be at least three feet higher than roof peak for best draft. Buildings or trees nearby may cause downdrafts. A chimney that leaks smoke or that has much of its surface exposed to the weather may have poor draft. An automatic regulator will cut heat losses from excessive draft.
- ☐ **Soot** in the combustion chamber and flue acts as an insulator, robbing you of heat. So does an accumulation of fly ash. Soot in the chimney limits draft. Clean it out.
- ☐ **Insulation** around hot-air ducts and water and steam pipes will send the heat where you want it. So will insulation on the furnace. Insulation is especially important on ducts or pipes that pass through outside walls.
- ☐ **Rust and scale** accumulate in boilers and furnaces, cutting down heat output. The same thing happens in hot-water tanks. Use some boiler-cleaning compound.
- ☐ **A hot-water coil** in a furnace uses heat. If too close to the fire, it may reduce efficiency.
- ☐ **Thermostatic controls** will do a better job than you can—even though you think you're a check-and-damper expert. Too low a setting of a hot-water or steam limit control can keep a boiler from reaching efficient temperature.
- ☐ **Too little heat in one room** forces you to overheat the rest of the house. A circulating

blower will help if it is a hot-air system. For a hot-water system, use a circulating pump.

☐ **Leaks and cracks** cost money. Warped fire and ashpit doors let in more air than a fire needs. A crack around a clean-out door cuts down efficiency. Seal it with furnace cement. Cement any leaks in fire pot or furnace sections. Repack leaking radiator valves.

☐ **Too few registers or radiators** overwork the heating system. A bright metal shield behind a radiator makes it radiate more heat out into the room. Dust in or on registers and radiators also cuts heat output.

☐ **Warm-air ducts** should be equally spaced around all sides of the bonnet. In a gravity hot-air system, the ducts must slope up so heat can rise. Sharp turns slow circulation.

☐ **Cold-air return ducts** are often too few in number. The area of all return ducts should be 20 percent greater than all hot-air ducts. The cold-air return should enter furnace at floor level in a gravity system. Drawing in outside air and heating it costs money. See if additional inside returns can be substituted.

☐ **A warm-air blower** should be set to run for some time after a burner stops. Otherwise, all the heat produced is not used. If you have air filters, clean or replace them often.

☐ **Steam-radiator valves** should permit rapid discharge of air from the system. If they don't, you lose. Air trapped in hot-water radiators should be vented regularly.

☐ **Enclosures over radiators** may interfere with heat output. Unless they are designed for heating efficiency, better remove them.

If you burn coal...



☐ **Warped or broken grates** will waste fuel and make it difficult to keep a fire. Buy new ones. Keep a protective layer of ashes over grates. This will lengthen their life.

☐ **Firing methods are important.** Avoid black smoke from the chimney. It means you are wasting coal. A hot fire for quick heating costs money too. Heat your home with a steady slow-burning fire. Don't bank too severely at night. Deep bed of coals makes a thriftier fire. In mild weather, leave deep bed of ashes at all except center of grates. Carry a deep fire there. Shallow fire is harder to control.

☐ **Shake down ashes** only until first red glow shows in pit. Sifting ashes and throwing larger pieces on fire cuts burning efficiency. Clean out clinkers to avoid damage to stoker.

☐ **Know your stoker.** Adjust feed so home is kept warm with moderate running intervals. Adjust air for a glowing red fire, not a white one. Coal that's too coarse will burn too fast. Coal, ashes or clinkers clogging the air openings will

interfere with combustion. If you use coke, break it up with a poker.

If you burn oil...



☐ **Nozzle size determines fire size.** A flame that is too big or too small costs money. Air should be set so you have neither a smoky nor a blow-torch flame.

A worn or dirty nozzle will waste fuel. If oil drips from nozzle while the burner isn't running, check shut-off valve.

☐ **An ignition system** that doesn't ignite fuel quickly wastes oil. Clean soot or dirt from the electrodes, and set the gap according to the manufacturer's recommendations.

☐ **A CO₂ check** should be made twice a year to determine completeness of combustion. Your heating man can also check stack temperature.

☐ **Clean the filters.** If there's none in your oil line, better install one. Dirt in the oil means trouble. Also clean strainer built into burner fuel pump. Better clean oil line too. If yours is a vaporizing burner, use oil-line cleaner weekly.

☐ **Dirt or carbon** on the bimetal element of the stack switch can disrupt its operation. Inside burner housing or on fan blades, dirt or carbon can cut air so fire burns poorly.

☐ **Vaporizing burners** collect carbon easily. It is important to keep all parts of burner clean. If fire is weak or smoky, the constant-level valve probably needs resetting.

If you burn gas...



☐ **A thrifty flame** requires that regulator at burner be set correctly to control pressure or rate of gas entering burner, that piping and cocks between meter and burner be large

enough for sufficient flow, that the orifice be free of dirt or grease, and that there be just the proper amount of air. Dirt in venturi tube or over the air shutter can reduce flame.

☐ **Baffles properly placed** in the combustion chamber will improve efficiency. Installed incorrectly, they interfere with good burning.

☐ **Burner position** in the fire pot controls heat distribution. Have an expert check this.

☐ **A pilot that is too large** can use a lot of gas needlessly. But don't turn it *too* low.

☐ **Little chimney draft is needed** for a gas flame. A strong draft will draw warm air out of basement. Consider a means of reducing it.

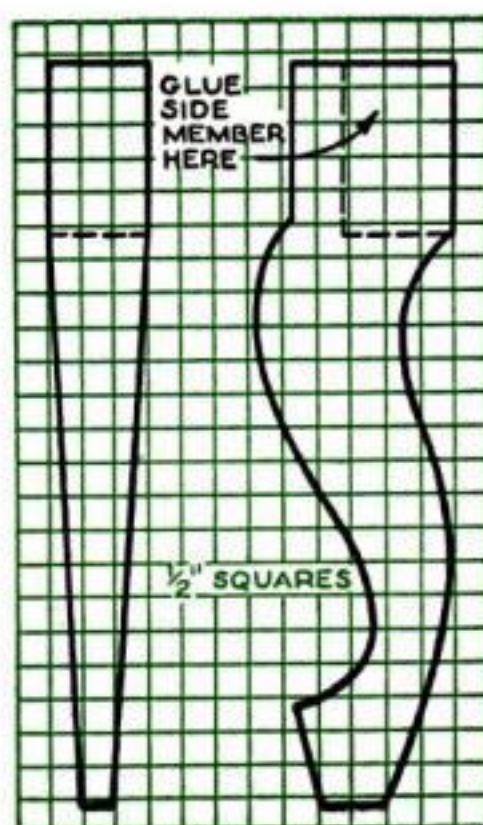
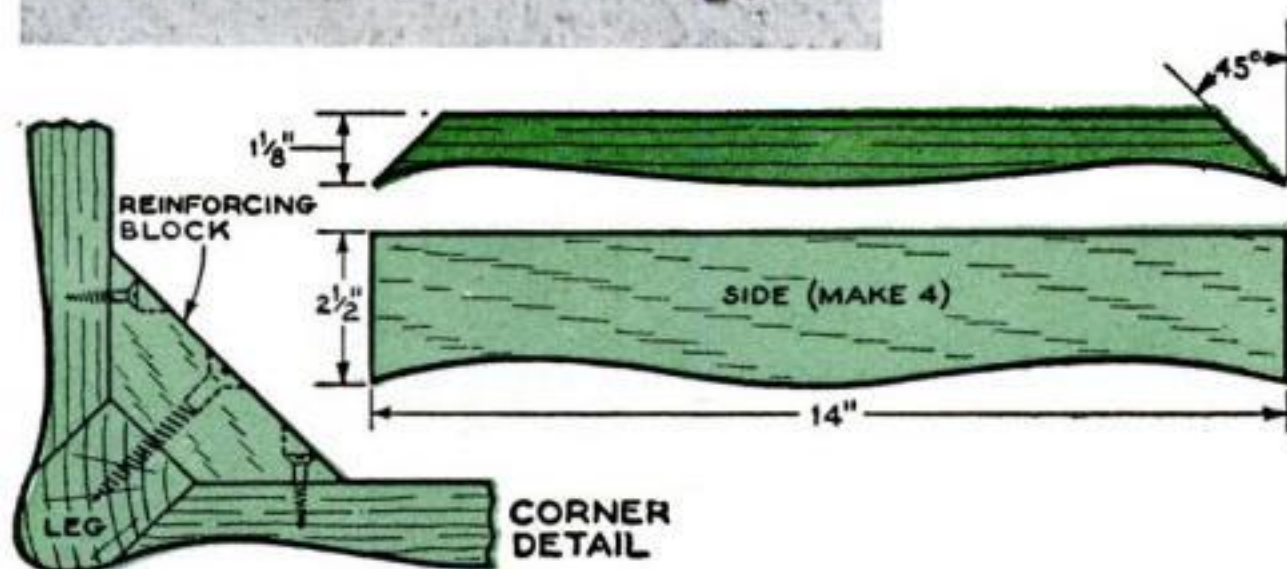
☐ **Frequent operation for short periods** may indicate waste. Have burner adjusted to operate longer with longer intervals between.

If a cold snap freezes pipes, there are tricks to the thawing-out job. See PS next month.



Carved Stool Needs No Carving Skill

Its flowing curves and etched lines are easier to make than you may think.



TURNING out a stool like this opens your eyes to the ease with which wood can be shaped into handsome furniture. Graceful curves and decorative carving make the stool look like the work of a skilled craftsman. Actually, I built it, and I'm a novice at woodworking.

You need only a few tools—saw, hammer, chisel, rasps and clamps. The carving can

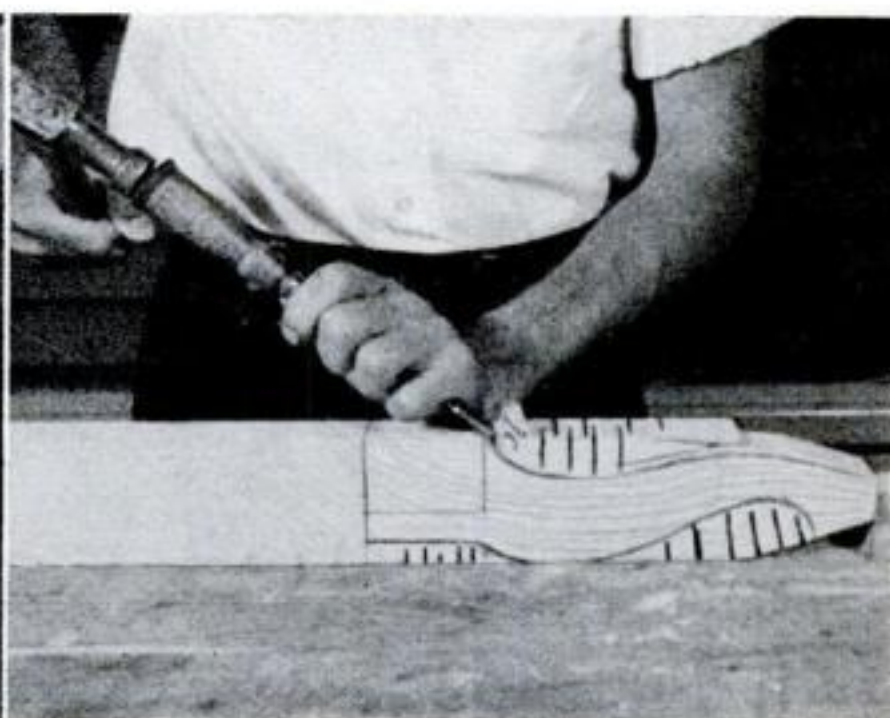
be done with that most common of all tools—a pocket knife.

I made the stool from white pine because this wood is so easy to work. The drawings and photos show how to duplicate it.

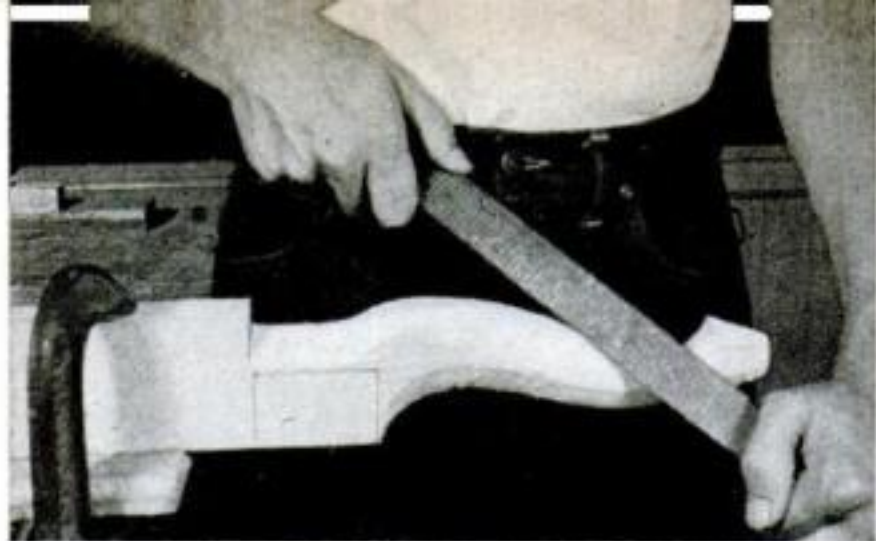
To produce the fruitwood finish usually found on the French Provincial style of furniture, I first applied a coat of very thin yellow stain. This was made by dissolving



1 Make full-size patterns from cardboard as first step and trace on wood stock. Place base of leg flush with squared end of stock.



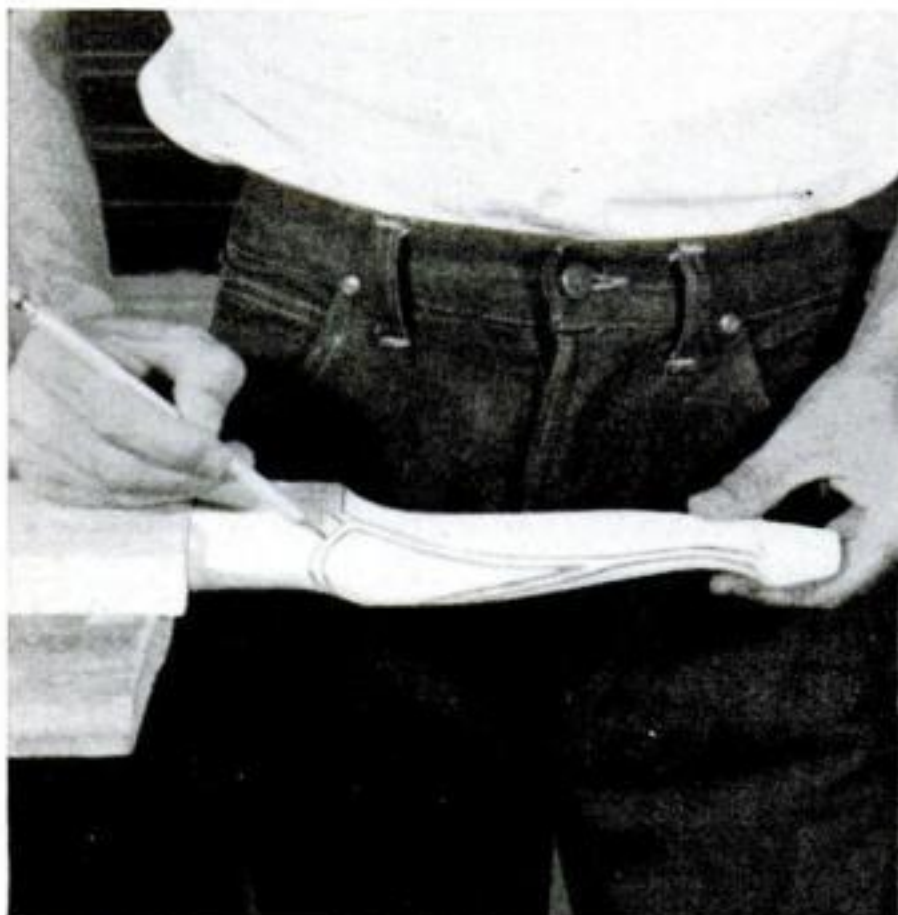
2 Rough out leg with hammer and chisel after making saw cuts. Complete the leg before sawing it free. (Continued on next page.)



3 Shape leg with a wood rasp, rounding the corners and tapering the sides. Smooth it with a fine rasp and No. 1 and No. 1/0 paper.

a small quantity of chrome yellow (artists' oil color) in turpentine. A brown oil paint (a mixture of burnt umber and burnt sienna) was then brushed on—and wiped off with a cloth. This makes the carved design stand out. Three coats of clear brushing lacquer, with fine sanding between each coat, completed the finish.

The cushion, made of unbleached muslin, was stuffed with kapok and covered with needlepoint.—*John Rogers, Dallas.*



4 Draw carving outline with pencil, and saw leg free from stock. Carving can be done with the small sharp-pointed blade of pocket knife. Make first cut along outline, holding



blade at right angles to cut. Make second cut about 1/8" from first with knife at angle so sliver of wood is loosened. Sand the carved areas and the carving job is completed.

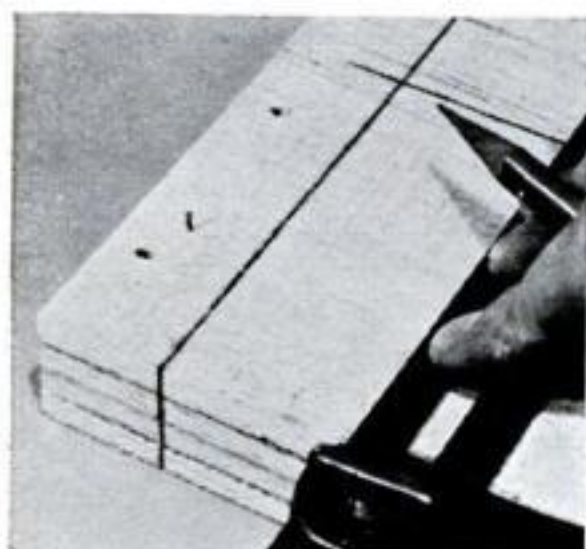


5 Assemble with glue and wood screws after all parts have been completed. Let glue harden a day or so. Then sand joints smooth.



6 Tack webbing tightly across top as support for the cushion. Upholster the stool after applying finish to the legs and sides. **END**

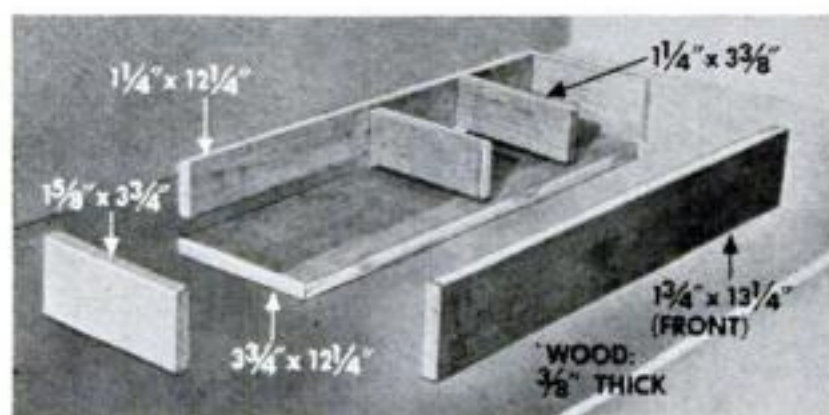
From Packing Box to Sewing Cabinet



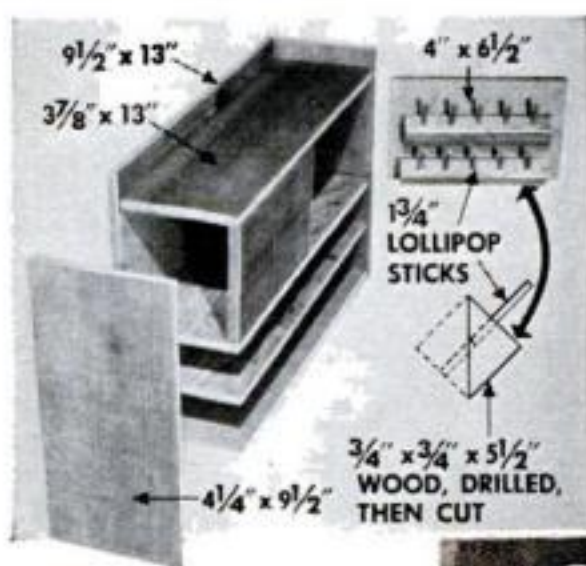
1 Wood salvaged from these apple boxes was tacked together by driving long brads through waste areas. Identical pieces for cabinet and drawers were squared off (left) and cut at same time. In knocking boxes apart, use a block of scrap wood under the hammer so the wood will not be marred.



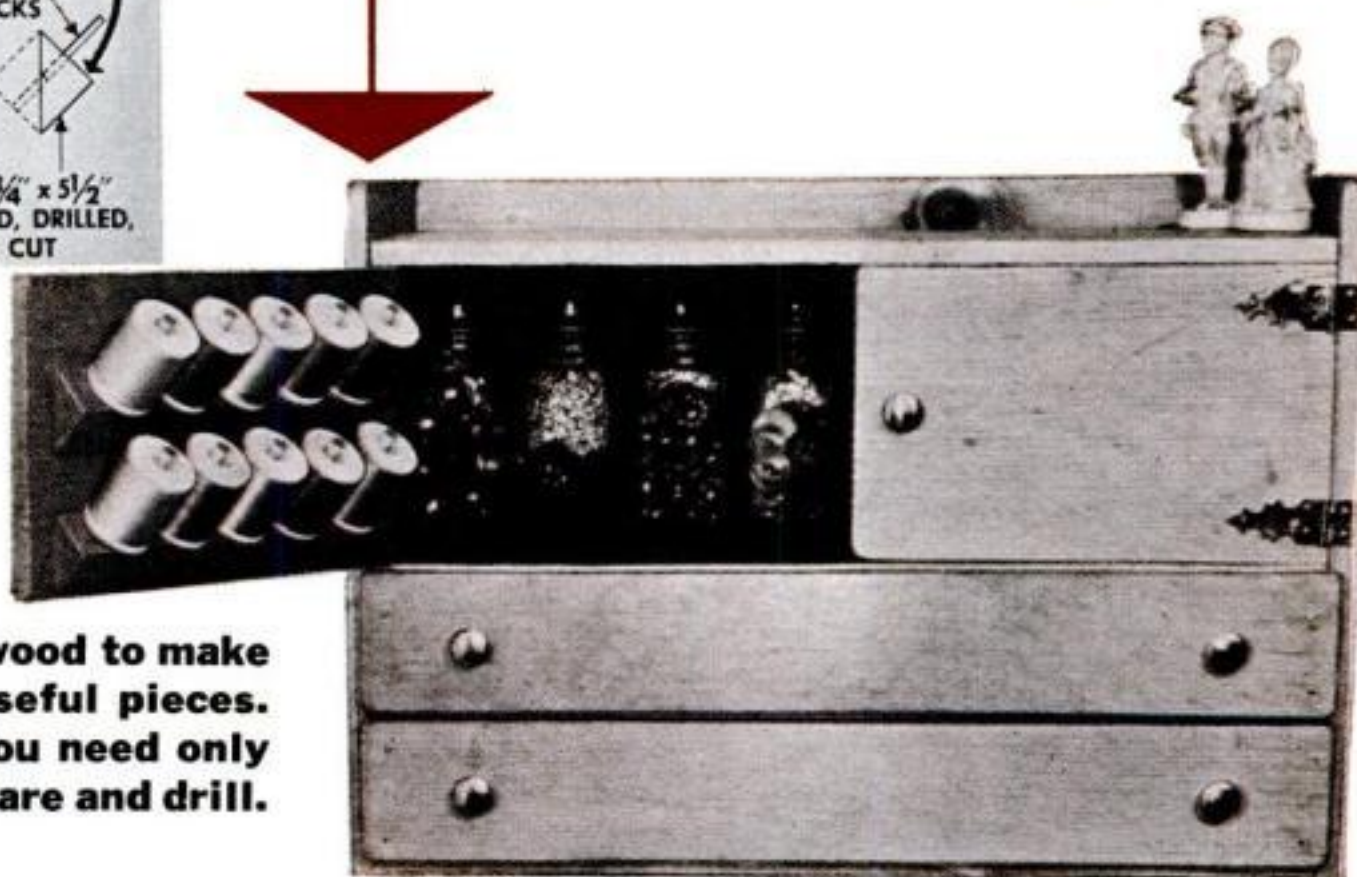
2 Drawer parts were cut and assembled first. Rest of cabinet then was built around drawers. Upper drawer (right) has two spacers, providing compartments for buttons, needles and other small items. Spacers were omitted from bottom one to take scissors and large items. Parts were sanded smooth before assembly.



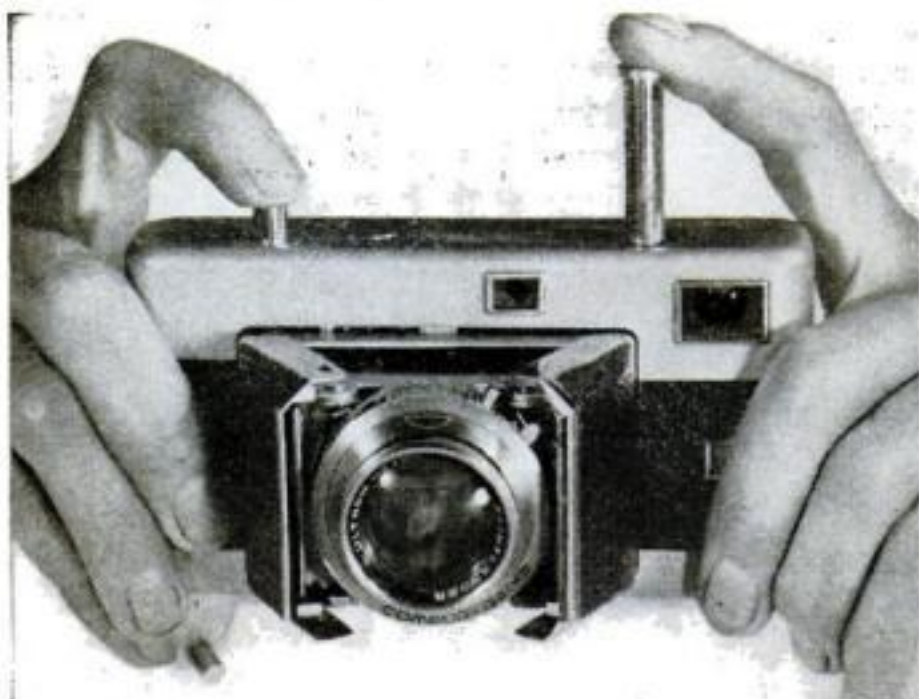
3 Main cabinet uses easy-to-cut parts. Spools go on lollipop sticks pressed into holes drilled in triangular-section blocks on doors. Put drawers in place and shim them with cardboard strips to provide proper clearance while lining up the drawer separators.



4 Escutcheon pin driven into upper corner of each door serves as latch. It catches in dimple drilled in under side of top piece. Other required hardware includes six drawer pulls, four small hinges, and pins to mount them. Paint the inside of drawers and top compartment, give outside a natural finish. Nails through back hold cabinet on wall. Buttons are kept in pill bottles.



Old crates supply wood to make many handsome, useful pieces. For this cabinet, you need only a hammer, saw, square and drill.



Imported Cameras Shoot Fast

SUPPOSE you wanted to photograph an old factory stack being blasted to the ground. How many pictures could you take while it was falling?

By alternately pressing two controls of the new Voigtlander Vitessa, shown in the two photos above, you could make a picture each second. The tall plunger cocks the shutter and advances the 35-mm. film. The other makes the exposure. Two doors fly open, bringing lens and shutter into position at the touch of another button. Willoughby's, New York City, is the distributor.

Rapid shooting is also a feature of the new Retina IIa (right) a 35-mm. camera imported and distributed by Eastman



Kodak. Swinging a lever advances the film, cocks the shutter, sets the film counter and unlocks the body shutter release.

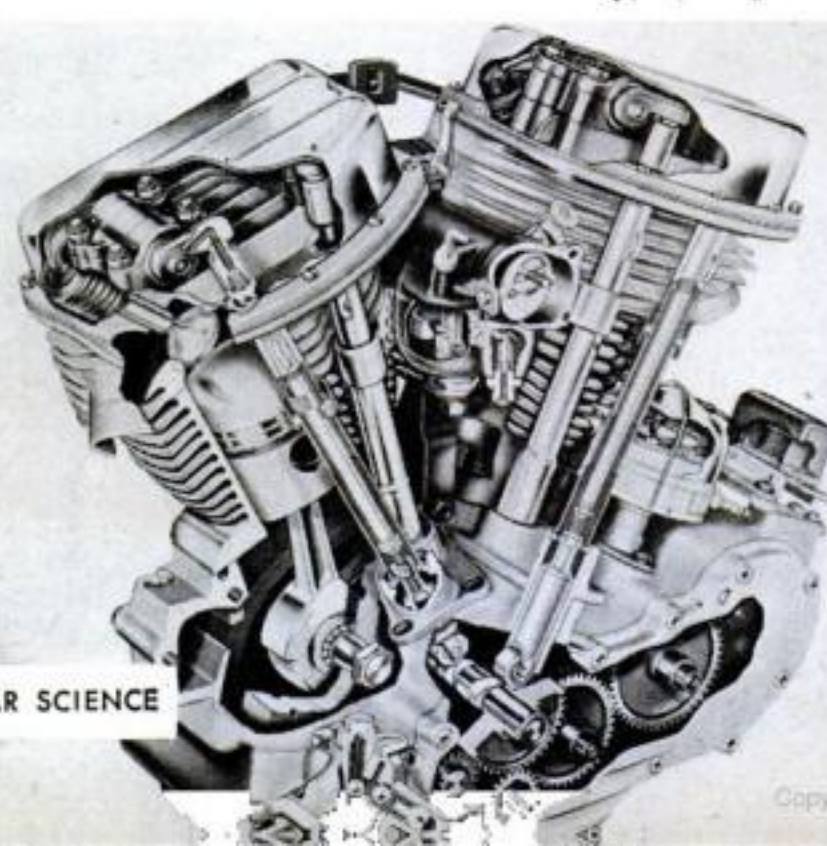
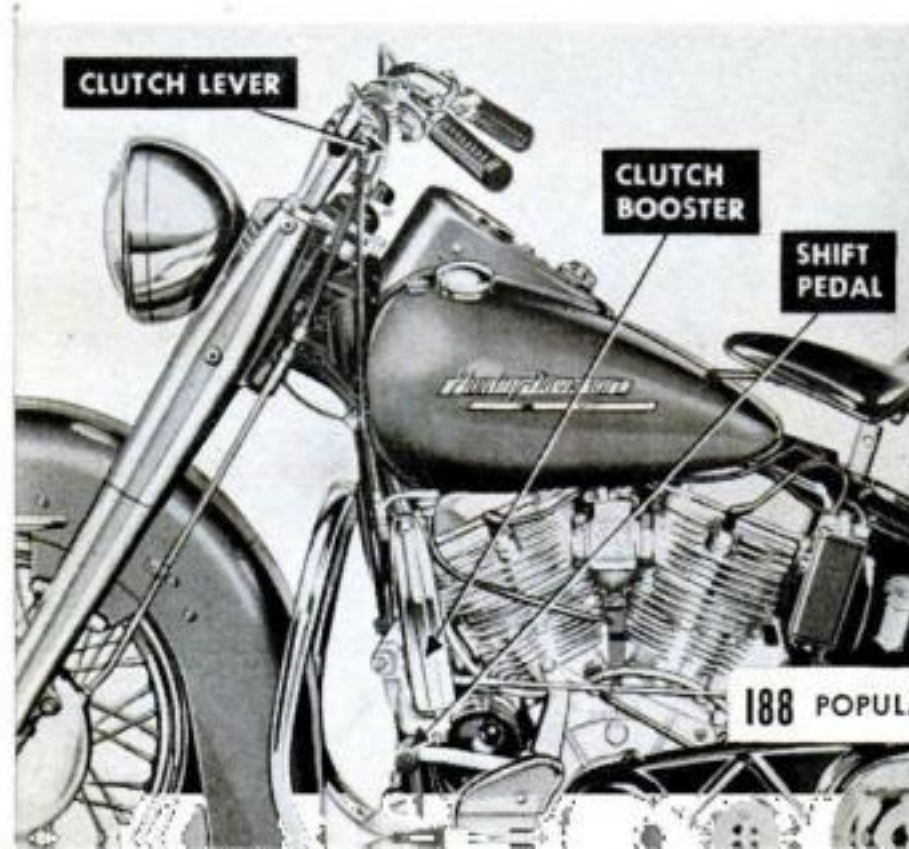
Both cameras have $f/2$ lenses, shutter speeds up to $1/500$ second, and coupled range finders. The Retina has built-in flash synchronization. The Vitessa costs about \$150, the Retina somewhat more.

Harley Offers Optional Foot Shift on Two New Models

A FOUR-SPEED foot shift on two new 1952 Harley-Davidson motorcycles lets you shift without taking your hand off the handlebars. Optional on the 61- and 74-cubic-inch overhead-valve models, the toe-operated pedal moves through low, neutral, second, third and fourth. Reverse is not available. A

clutch lever is mounted on the handlebars. A booster spring helps the driver release the clutch.

Exhaust valves in the overhead-valve engines have been given an oil-absorbent phosphate coating. A new muffler is said to reduce back pressure.



Starting Your Car in Zero Weather

It takes more than pushing a button to get a car going when the mercury drops out of sight.

By E. F. Lindsley



WHEN winter nights pull the rug from under the thermometer, will your car always kick off in the morning? Or will the starter give a few groans and lapse into dismal silence?

In my case, the questions hit right home. I live in Wisconsin, where the thermometer often dips to 20° below, so I jumped at the chance to round up information about winter starting for *POPULAR SCIENCE*.

What I have found out should help people with heated garages as well as the rest of us

who aren't so lucky. That's because a car that sits in an open parking lot for hours can easily need first aid to get going again.

We'll take it for granted that before winter sets in you'll put your car in top mechanical condition, remembering such things as a lighter oil, a charged battery with sound tight cables, and clean spark plugs. If your engine is in good shape, knowing *why* cold engines are hard to start, and using starting techniques based on this knowledge, will usually get you on your way.

Why Cold Engines Are Hard to Start

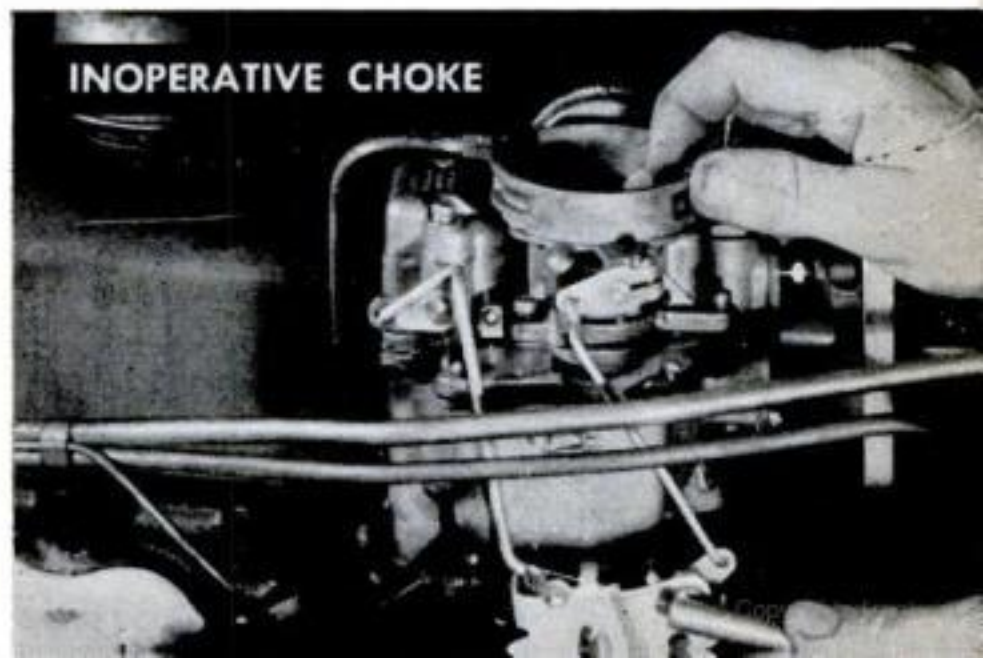
THERE are four basic reasons why a car is harder to start in periods of low temperature. First of all, congealed oil creates high internal friction, putting a heavy cranking load on the starter and battery.

This might not be so serious if the battery didn't lose a lot of pep in cold weather because its chemical activity is slowed down. The chart on the next page shows how serious this drop can be. If the thermometer goes low enough, even a fully charged battery is pretty feeble. Add to these two handi-

caps the tendency of gasoline to condense wetly on the manifold walls instead of entering the cylinders as a burnable vapor, and you have the root of the problem.

The fourth troublemaker is that in some unsuspected way the engine may not be up to snuff. For instance, frosted or snow-covered ignition parts will almost certainly impair starting, especially if ignition wires are cracked or rubber seal caps missing.

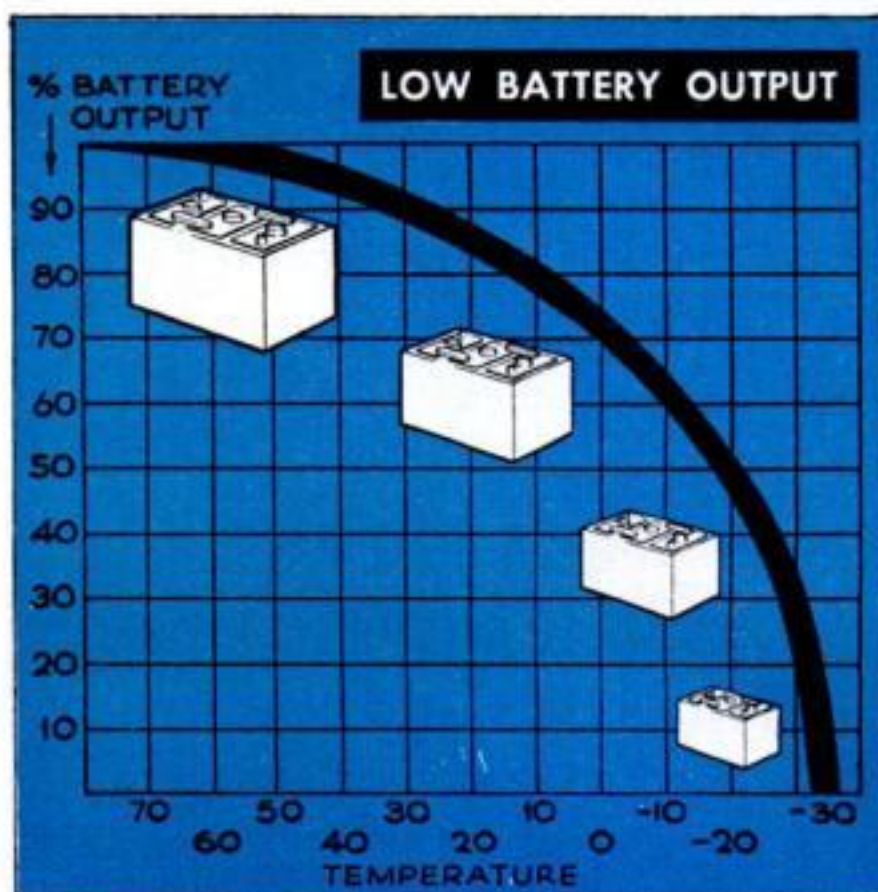
Or perhaps the linkage on an automatic choke may be so gummed up with varnish-



like fuel residues that the choke can't operate. These deposits should be washed off every 5,000 miles with lacquer thinner. Most other solvents won't work.

This is a job often overlooked in a fall tune-up for winter. When you look into it, check at the same time on the action of the choke unloader by having someone push the accelerator clear to the floor. Or you can pull the throttle rod wide open by hand. The choke butterfly should pop open. This is very important.

Modern cars with automatic chokes all have some kind of choke unloader. If an engine does not start after a reasonable interval of cranking, you use the unloader by holding the accelerator pedal to the floor while operating the starter for a few seconds.



How to Use Your Starter



STEPPING into your car in subzero weather, don't expect the battery to deliver more than half a dozen whirls of the starter. It may do better, but a pessimistic approach will help keep you from wasting what little output it is able to give. Remember it

must do two jobs at once—turn over the cranking motor and supply juice to the coil.

How to start may vary a bit from engine to engine and you'll have to learn what gives best results with yours.

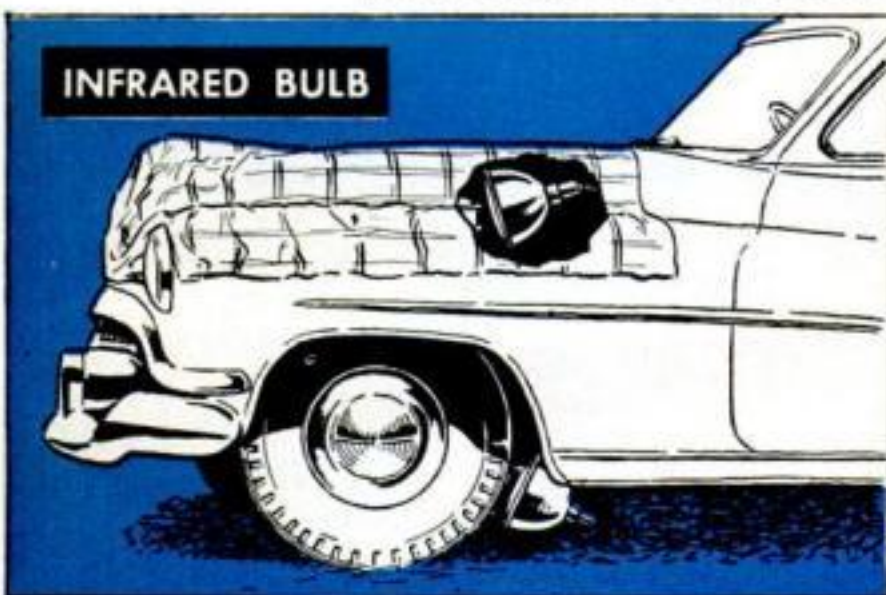
Get ready before you hit the starter. Hold down the clutch pedal (if you have one) to take the transmission load off the engine. Apply the choke by pulling out the control if it is hand-operated. Depress and release

the accelerator, then hold it partly down. (On some cars, pumping the accelerator two or three times to shoot gas into the carburetor throat is a definite help. On others, this will only get you into trouble. Your operator's manual or experience will show you which is best in your case.) Finally, turn on the ignition switch and hit the starter.

It's often best to operate the starter in bursts of about five seconds each. You will sometimes find that the engine kicks off just as you release the starter. This is because the battery at that split second can deliver hotter sparks at the plugs. If the engine fails to start in half a dozen starter bursts, use the unloader and try again.

When the battery lacks enough oomph to turn the starter, a push or rolling down a hill is always a good bet. The weak battery can then devote all its energy to delivering a good spark. Shift into high gear, not low or second, for this.

Here Are Some Simple Starting Aids

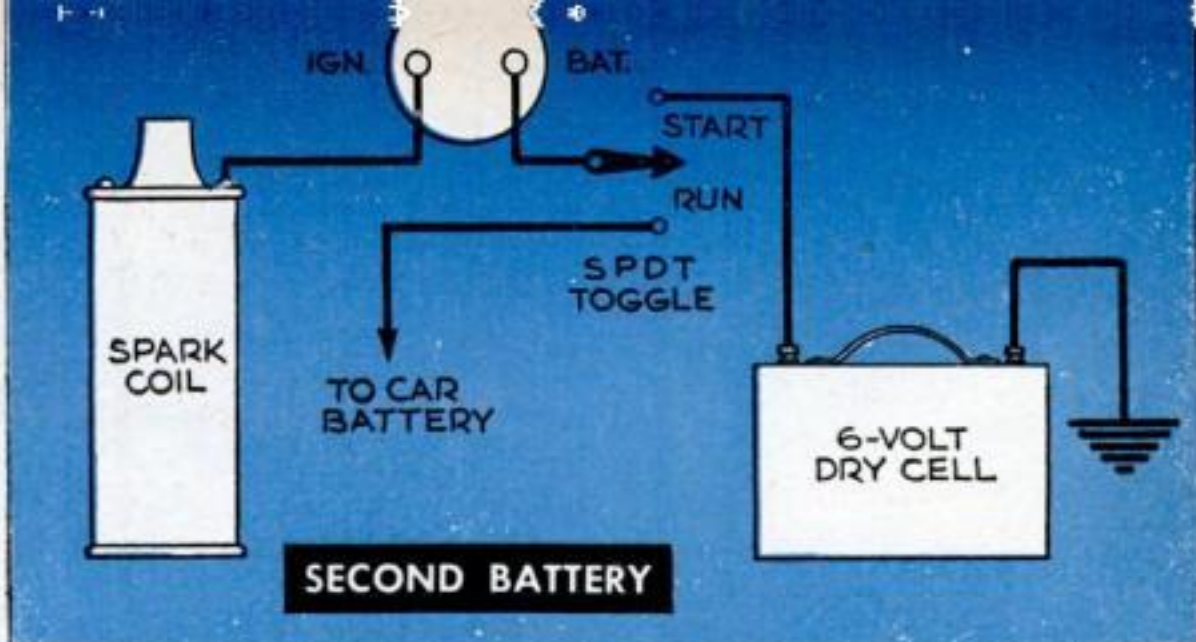


IF THE car is inside a garage or otherwise sheltered, one or two reflector-type infrared bulbs will do a good job of keeping the engine warm. Use them on an all-night basis.

An ordinary 100-watt bulb in a large tin can will also keep the oil moderately warm. Trim the can so it is a close fit under the deep part of the oil pan. In such extensions of your 115-volt system, be careful of shocks and shorts—calcium chloride, widely used to de-ice roads, makes a perfect electrical path when it drips on a garage floor.



**100-WATT BULB
IN TIN CAN**



SECOND BATTERY

An extra six-volt battery with leads to be clipped on in parallel with the regular battery may be the solution to low cranking power. The accompanying sketch shows a neat permanent installation. Here, a six-volt dry-cell battery is used to supply juice to the ignition system during the starting period, freeing the regular car battery for the single job of cranking the engine. Throwing the

switch after the car is running returns the load to the regular battery. If the extra battery is installed with easily disconnected leads, it can be kept in the house overnight. Thus kept warm, it will deliver more juice in the morning.

A trickle charger to keep the electrolyte in your battery active overnight is another practical idea. So is warming the battery.

Starting Aids That You Can Buy

BELOW and on the next page are some of the starting aids now on the market. One alone or a combination of several might help you out. First, though, you should be sure they meet the requirements of your car, taking into consideration the place where you keep it.

For instance, an electric heater at the end of a 200-foot extension cord will be too hampered by voltage drop to do its job. A water-jacket heater that really does the trick for a closely fitted new engine may not help an old car. A kerosene burner may be a disappointment if water-white kerosene is hard to find.

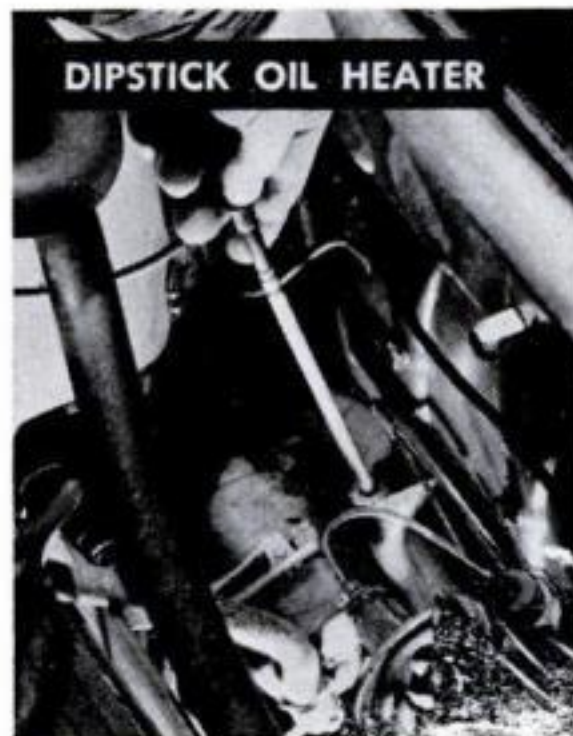
A headbolt heater is mounted permanently in the engine water jacket. It comes in sizes to suit all modern cars, but checking is necessary to be sure the water jacket is

clear under the bolt opening you select. An extension cord plugs on the heater head.

A Calrod water heater goes inside the water inlet hose and an electrical lead runs to a receptacle mounted somewhere on the grille. Hook up a 115-volt extension cord and it goes to work.

If yours is a V-8 engine with two water inlets and two outlets, two headbolt or two hose heaters will do a better job—although one is usually enough.

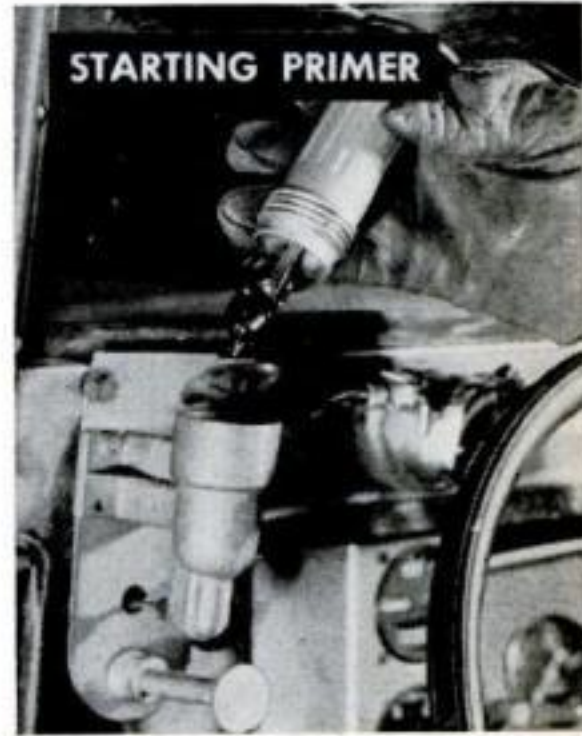
Less expensive than permanently installed jobs, an oil-immersion heater inserted in the gauge hole will keep the oil at startable temperature while the car is garaged overnight. It is not recommended, however, for bringing a completely cold engine up to starting temperature. This type of heater might be used in conjunction with a water heater



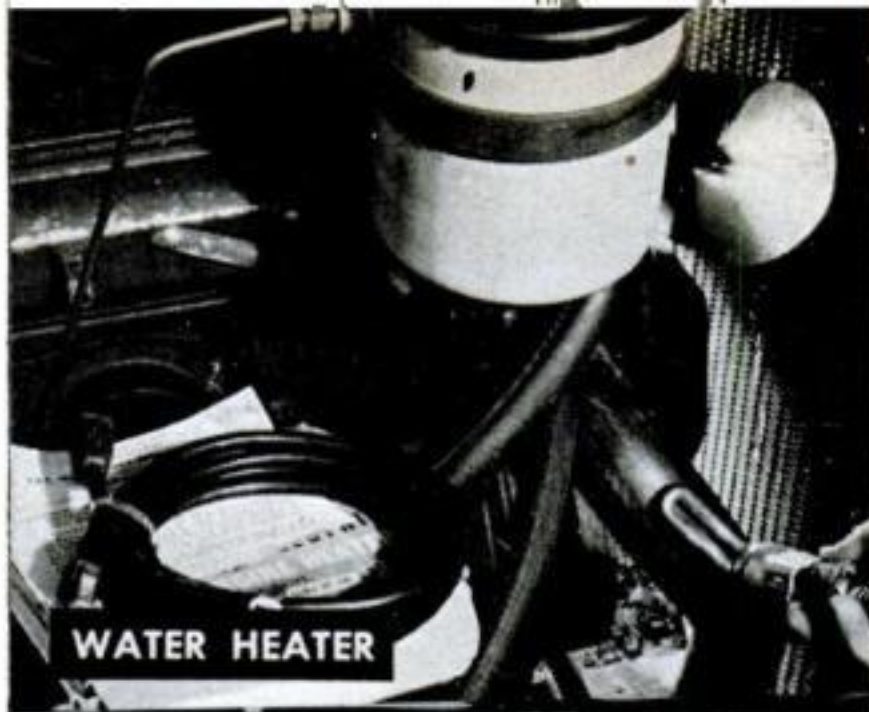
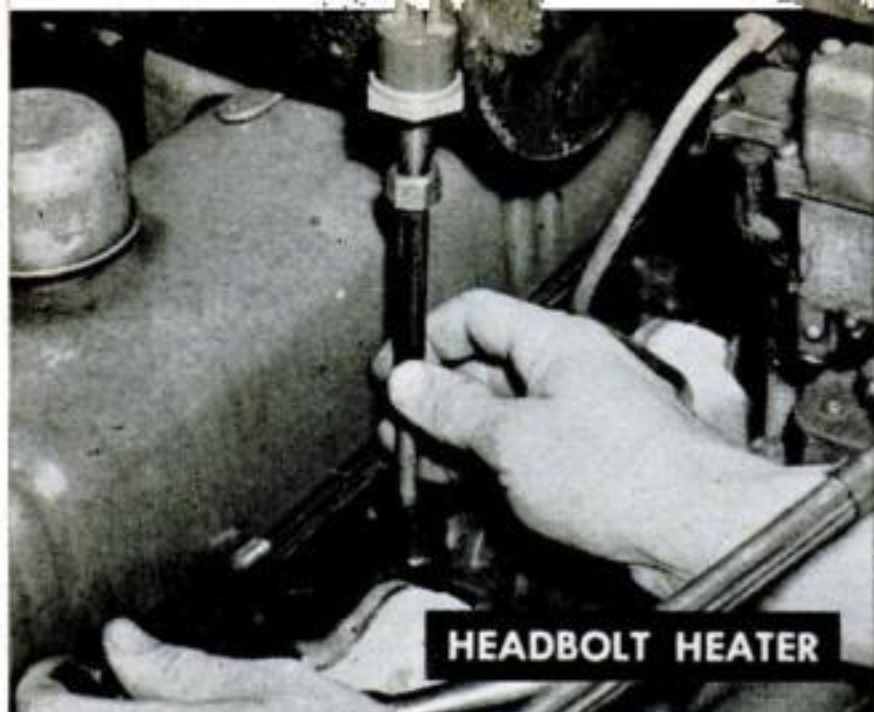
DIPSTICK OIL HEATER



KEROSENE HEATER



STARTING PRIMER

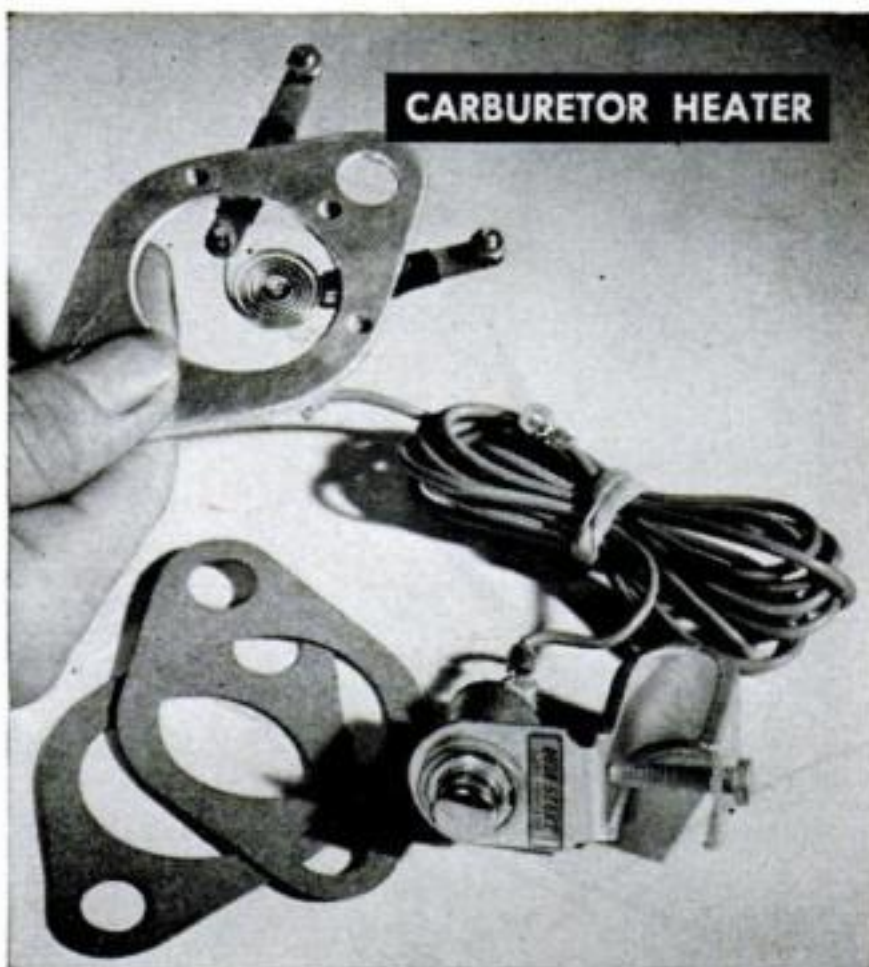


since the latter may not warm the oil very much.

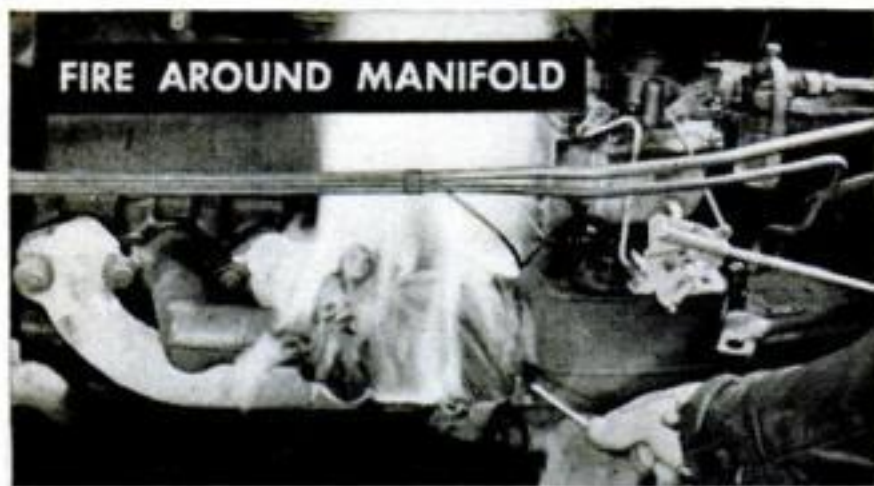
Designed to help vaporize cold fuel, a carburetor preheater includes a heating element mounted in the fuel passage between the carburetor and intake manifold. This heater is switched on for a few seconds before the starter is engaged.

Another way of giving the fuel a shot in the arm is to use a Chevron starting primer. This gimmick punctures a gelatin capsule filled with a highly volatile ether-base fuel, and a nozzle sprays the fuel into the intake manifold. A new capsule is required for each starting attempt. These are most useful with updraft carburetion and manual chokes.

For cold-weather operation, a gas-tank antifreeze is always a wise purchase. Ice in the fuel lines or carburetor is a pretty common problem.



Strictly for Emergencies!



SOMETIMES, getting started may be a life-or-death matter. A car stalled in a remote spot in severe cold is no place to spend the night. Such a situation may call for drastic methods. Building a fire in the right place has been known to start a stubborn mule. If you must, you can do the same with a car.

Oil-soaked sand, asbestos or rags ignited in a hub cap and pushed under the engine will warm up the oil pan. Unless gasoline leaks are present, this is not particularly dangerous. Keep flames away from wires or hoses.

In conjunction with a fire under the oil pan, you could burn oily rags along the intake manifold to vaporize the fuel enough to get you started. Don't be alarmed if small flames play around the edges of the carburetor, but keep the fire away from wiring and rubber fuel or heater lines. A shovel of snow will douse the fire quickly. **END**



An Engine to Dream About

WHAT kind of car engine would *you* build if you had the technical resources of General Motors at your disposal? That's a question several GM engineers no longer have to wonder about.

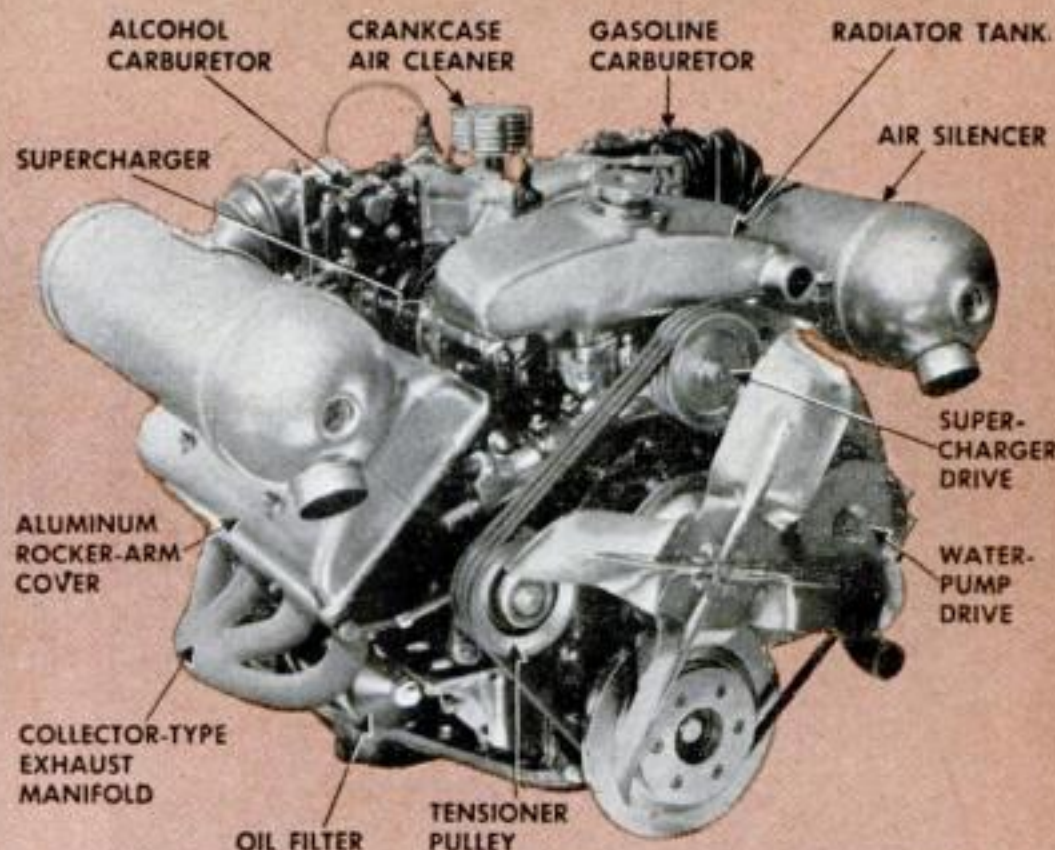
They designed and built this engine for two General Motors experimental cars—Le Sabre (pictured above and described in PS, Feb. '51, p. 130) and Buick's dream convertible (PS, April '51, p. 111). Like the cars, the engine won't go into production, but will undoubtedly influence future models.

A supercharged V-8, the engine has two aircraft pressure carburetors to ram in the fuel—premium gasoline at low engine speeds and methanol when it revs up toward its peak. A Roots-type supercharger nestled between the 90° cylinder banks whips up a manifold pressure of 18.2 pounds per square inch at 5,000 r.p.m.

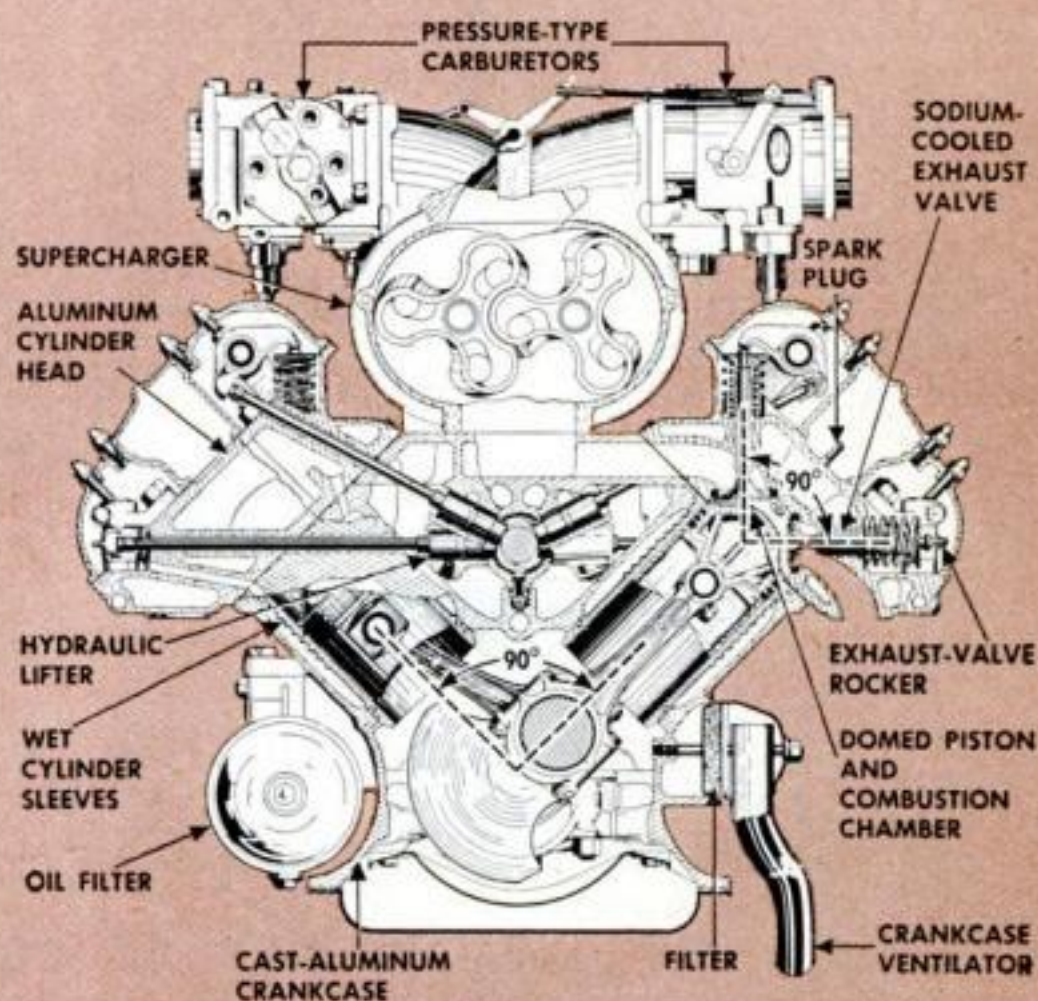
Methanol Really Makes Her Hum

Despite a compression ratio of 10 to 1, the gasoline carburetor gives satisfactory operation with premium gasoline while the engine is developing less than 125 hp. The methanol carburetor comes into action when the gas-carburetor throttle is nearly wide open.

The designers shot for a power maximum of 300 hp.—and that's how the engine has been billed. Actually, in dynamometer tests, its output has been as much as 335 hp., a very creditable figure for a weight of only 550 pounds and a piston displacement of 215.7 cu. in.

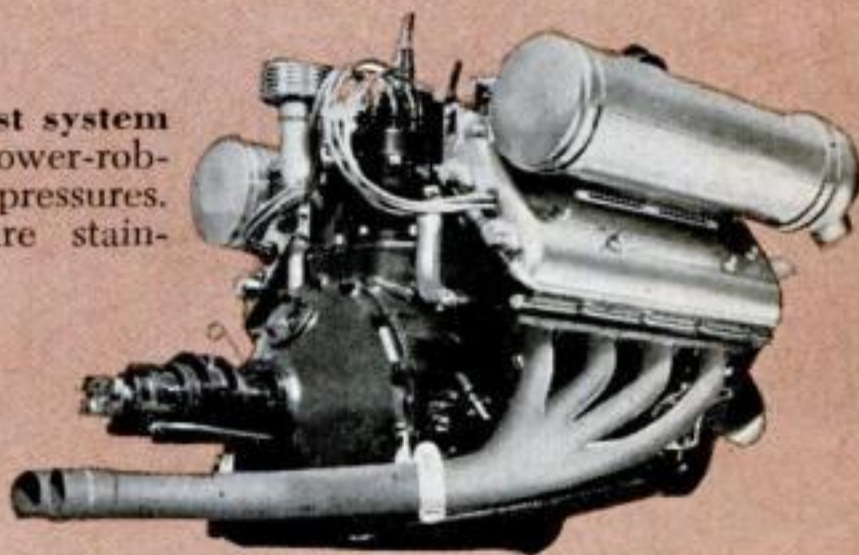


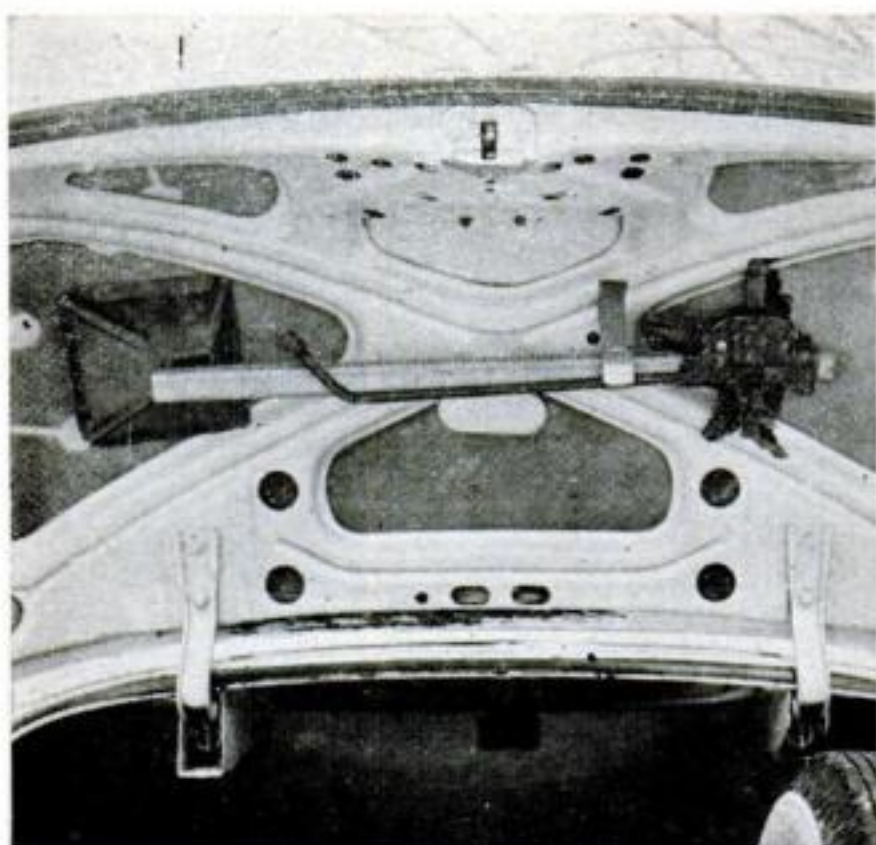
Where's the generator? You won't find one on this engine. Instead, it is located at the rear of the car, and is belt-driven off the propeller shaft. Radiator tank is mounted on engine, core ahead of it.



It's a "square" engine, the bore and stroke both being equal—3½". The exhaust-valve push rods operate through passages drilled between the cylinders. Their rockers work on individual short shafts.

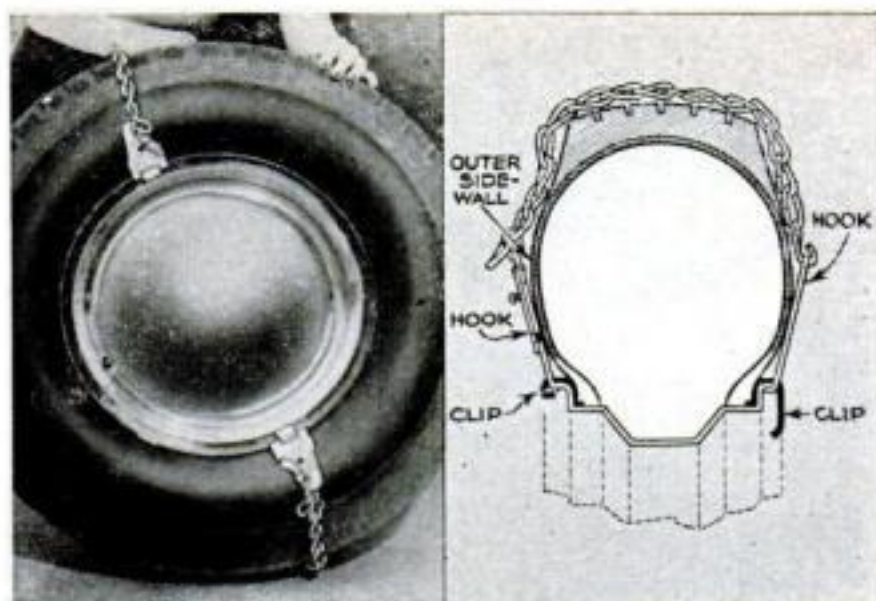
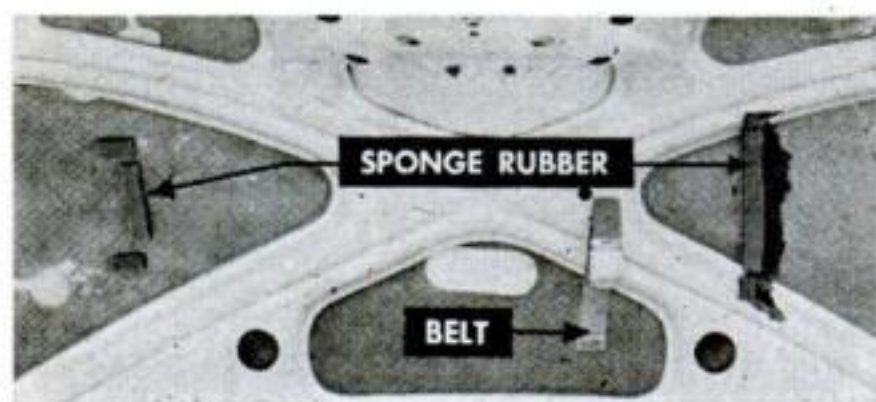
Dual exhaust system cuts down power-robbing back pressures. Manifolds are stainless steel.





Jack Mounted Under Trunk Lid

THE only place allotted for the jack in most cars is the floor of the trunk, where it rattles. I carry mine as shown above. A surplus army web belt, attached with sheet-metal screws (below), keeps the jack parts snugged up against noise-deadening sponge rubber. This location is handy if you need the jack while the trunk is full of luggage. A snow shovel can also be carried the same way.—L. L. Peterson, Lewistown, Mont.



Emergency Chains Clip on Rims

RETAINING clips for these new emergency chains are permanently mounted on the wheel. They're put in place by deflating the tire, breaking the bead and slipping them between bead and rim—two on the inner side of the tire, two outside. When chains are needed, a hook attached to the cross chain is slipped on the inside clip. A spring lock on the outside hook makes it possible to take up slack. Mounted directly opposite each other, the clips are said not to affect wheel balance. Presto Chain Company, Des Moines, is the manufacturer.

Antifreeze Can Mar Finish

ANTIFREEZE dripping on the fenders or hood of a car may spot the paint. An easy way to prevent the spotting is to wash the area with a mild detergent and water.

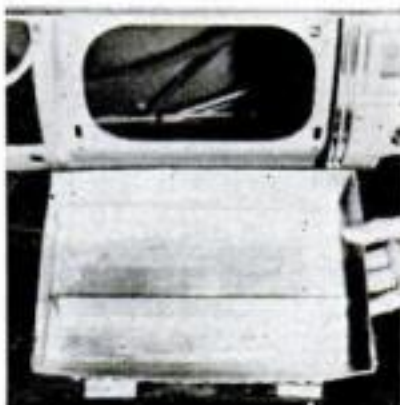
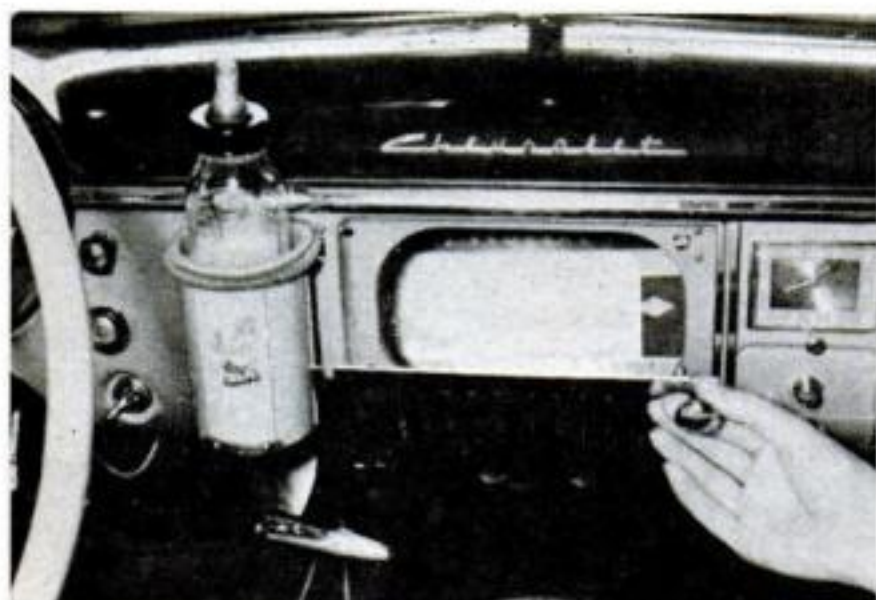


Area Behind Unused Radio Grille Offers Storage Space

IN CARS without a radio, the space behind the grille can be used to store overflow from the glove compartment. The photos show how Arne O. Salonen of Raymond,

Wash., handled this conversion in his car.

He screwed small brass hinges to the bottom of the grille, put a friction catch on the top edge and attached a knob outside for easy opening. Limit chains support the grille when open. Inside the opening he mounted a shallow pan formed from sheet aluminum. This was dimensioned especially to hold a box of tissues standing on edge so the box opening would face outward. As a companion project, he mounted a baby-bottle warmer on the radio control panel at left of grille.



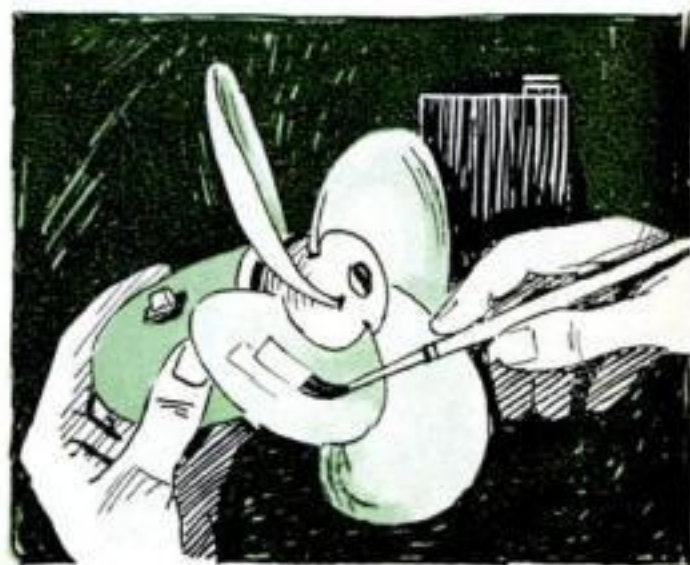
Winter Motoring Tips



Shield the Radiator. A large paper shopping bag pressed flat makes a handy shield when you want to warm up fast or prevent a radiator freeze-up while driving. Slip it down in front of the core. Put cord through one end of the bag and tie it to the radiator cap.



Protect Your Antifreeze. To keep a careless mechanic from draining off your costly antifreeze, you may want to buy an extra radiator cap and paint a warning notice on it as shown. It's better than the conventional tag, which frequently is torn off and lost.



Preserve Defroster Blades. Rubber defrosting fans can be kept pliable by brushing on a little rubber lubricant. Get the kind used with rubber spring shackles.



Spring Saves Tester Tubing. The tubing of an antifreeze tester gets a lot of abuse, especially in a large shop. To protect it, slip on a snugly fitting flexible coil spring. This will help prevent a break by keeping the rubber from being folded sharply.



Avoiding Frozen Locks. To lessen the chance that a door-lock push button may freeze, use an oilcan to squirt in a solution of carbon tetrachloride (95 percent) and paraffin (5 percent). Do this while locks are dry and at normal temperature. If your car has the door lock in the handle, slip a rubber-glove finger over it on wet days to keep out moisture.



Gus Gives the Air Force a Lift

Airman Crawford was at the end of his rope—and a frayed one at that—when he was towed into the Model Garage with mysterious car trouble.

By Martin Bunn

GUS WILSON had just finished with a gas customer and was hooking the hose nozzle back up on the pump when Stan Hicks, his young helper at the Model Garage, called to him.

"Hey, Gus, look what's coming."

Gus recognized the mile-weary old sedan that Silas Barnstable, our town's best-known penny pincher, called a car. Behind it, at the end of a frayed tow rope, was a maroon coupe.

"Going into the towing business, Silas?" Gus kidded as Barnstable brought his caravan to a stop in front of the repair shop.

"Now none of your sarcasm, Gus Wilson. Ain't it enough I'm bringing you a cash customer?"

At this point, the door of the coupe popped open and a good-looking young man in the blue uniform of the Air Force slid out from behind the wheel.

"This here's my nephew, Dale Crawford. One of them Air Force fellers. Been visitin' over to my house for a spell."

Gus shook the boy's hand. "Glad to meet you, Crawford. Didn't know this dried-up old horse trader had any relatives that would admit they were kinfolk."

The Air Force Won't Wait

Silas ignored the remark.

"Got car troubles," he said, jerking his head toward the coupe. "Ain't got much time either. Got to report or somethin' tomorrow night. But mind you, we're not paying you any fancy bills for hurry-up repairs."

Gus grinned. He was used to haggling

over prices with Silas. He'd been doing it for years. But he had an unexplainable liking for the old codger in spite of his miserly and cantankerous ways.

"You see, Mr. Wilson," young Crawford explained, "I just finished my basic training and stopped by to visit Uncle Silas for a few days on my way south—the base I'm assigned to is around 800 miles from here. I'm due there by midnight tomorrow and I'd expected to get an early start this morning but—"

"But your car wouldn't start," put in Gus.

"Oh, it started okay, but when I gave it the gas the engine rolled and vibrated like it was going to jump right out of the car."

"Shuddered like a sick cow," said Silas. "I made him shut it off."

No Trouble at All

When Gus and Stan had pushed the ailing car into the shop, Gus lifted the hood and began checking the motor mounts. "Had some work done on it recently?"

"Yeah, had it tuned up just before I left. One of the grease monkeys at the field picks up a little spare change by making car repairs."

"Had any troubles?"

"Not a one. Driving down here to Uncle's she breezed along like a well groomed T-6. That's a training plane," he added in answer to Gus's puzzled look.

"Well, let's start her up," suggested Gus, standing beside the opened hood.

The engine caught immediately. "You see, Mr. Wilson, she idles fine. Now watch what happens when I rev her up."

As Dale pushed down on the accelerator

When Gus pulled up in front of Silas' house, he found Crawford and Barnstable standing helplessly beside the opened hood.



"If it weren't for young Crawford, I'd let the old goat stew in his own juice," grumbled Gus. "Where are they?"

"Parked over in front of Barnstable's house. Want me to go?"

"No, I'll go. You take care of things here."

When Gus pulled up in front of Silas' house on the other side of town, he found Dale Crawford and Barnstable standing helplessly beside the opened hood. The engine was running.

Gus Gets His Wish

"She's acting up again," Dale said glumly as Gus walked up to the car. "We got back here fine—no trouble—but when I started her up again and fed her the gas to get going she began to vibrate and shake worse than she did before. Watch."

Sure enough, when Dale accelerated it the engine rolled and rocked so badly that it vibrated the whole car.

"Shut it off," called Gus. "No sense straining the mounts. I'll tow you back to the garage."

"Gosh, now I'll never make the base on time."

"We'll try to get you on your way as fast as we can."

Stan Hicks had a wide grin on his face when Gus in the wrecker, with Silas bringing up the rear in his old rattletrap, towed young Crawford's car into the shop. "Well, you got your wish," he quipped.

Gus said nothing, but went right to work. His first hunch was that something had gone haywire either with the vibration dampener or the flywheel, but when both proved to be in order he turned his attention to the ignition. He checked spark plugs, ignition wiring, distributor and coil.

—And Spots His First Clue

"See you've got a fairly new battery."

"Brand-new," replied Dale. "My old one was slowly pooping out so Uncle Silas took me to a cut-rate place down in the city yesterday and I bought that one."

Gus grunted. "Still trying to buy gold in bargain basements, aren't you, Silas?"

"There's no law against a man saving a little money, is there? Looks like any other battery to me."

Gus started to make some comment about how looks are only skin-deep. Instead he told Dale to start his car.

"She sure runs smoothly at idling," Gus

[Continued on page 242]

the engine roared, but there wasn't a sign of roll, buck, miss or vibration.

"It's fixed!" shouted Silas gleefully. "And Gus, don't you start figurin' on collectin' for work you didn't do."

"I can't understand it, Mr. Wilson," Dale Crawford said, as he let the engine idle again and then raced it just as he had before. "When I started to leave Uncle Silas' house this morning you'd have thought that engine was trying to shake itself loose from its moorings."

By this time, Silas had the repair shop doors swung wide and was shouting at his nephew to back the coupe out of the shop.

"What're you waitin' for, son? She runs fine, don't she? You can stop at the house to pick up that box lunch I packed for you and git along on your way."

Engine Refuses to Misbehave

Young Crawford hesitated for a moment, gunning his car's engine and looking quizzically at Gus. Then he slowly backed his car out of the shop.

"Well that's a hot one," said Stan as the two cars headed back down the road to town. "It's not like old Silas to imagine trouble, particularly when it might cost money. What do you suppose happened?"

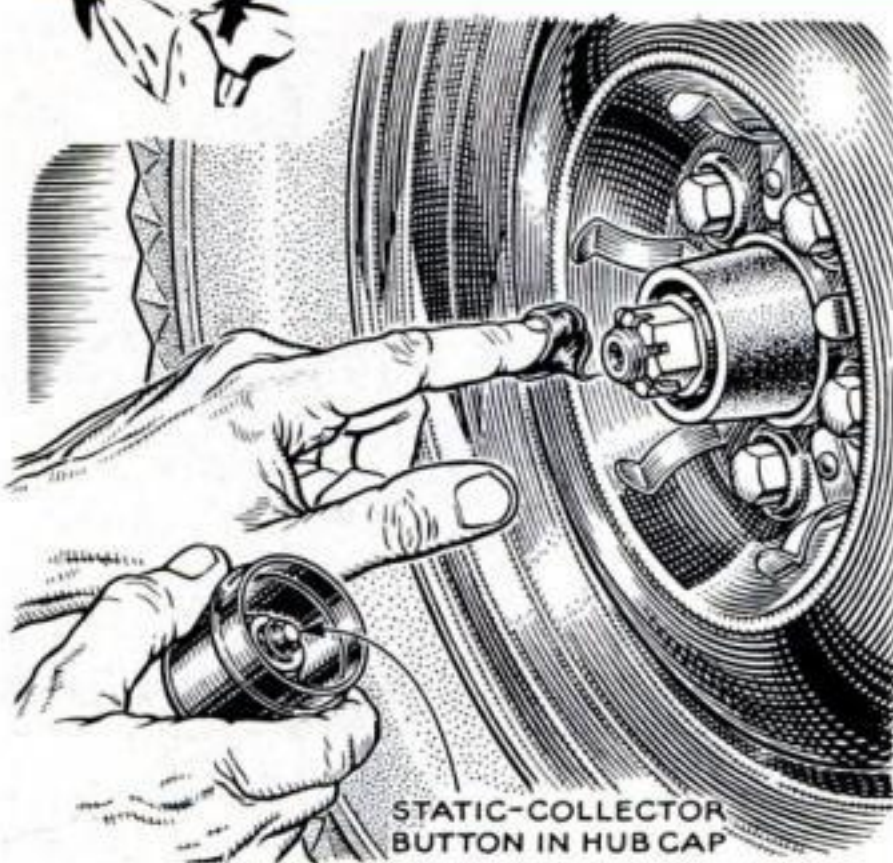
Gus shrugged. "One of those on-again, off-again troubles, I guess. For the kid's sake, I wish I could've checked it a little more."

Half an hour later, the phone in the garage office rang.

"That was Silas," Stan called out. "His nephew's car is acting up again and he wants you to come right over. Said he's even afraid to tow it this time."

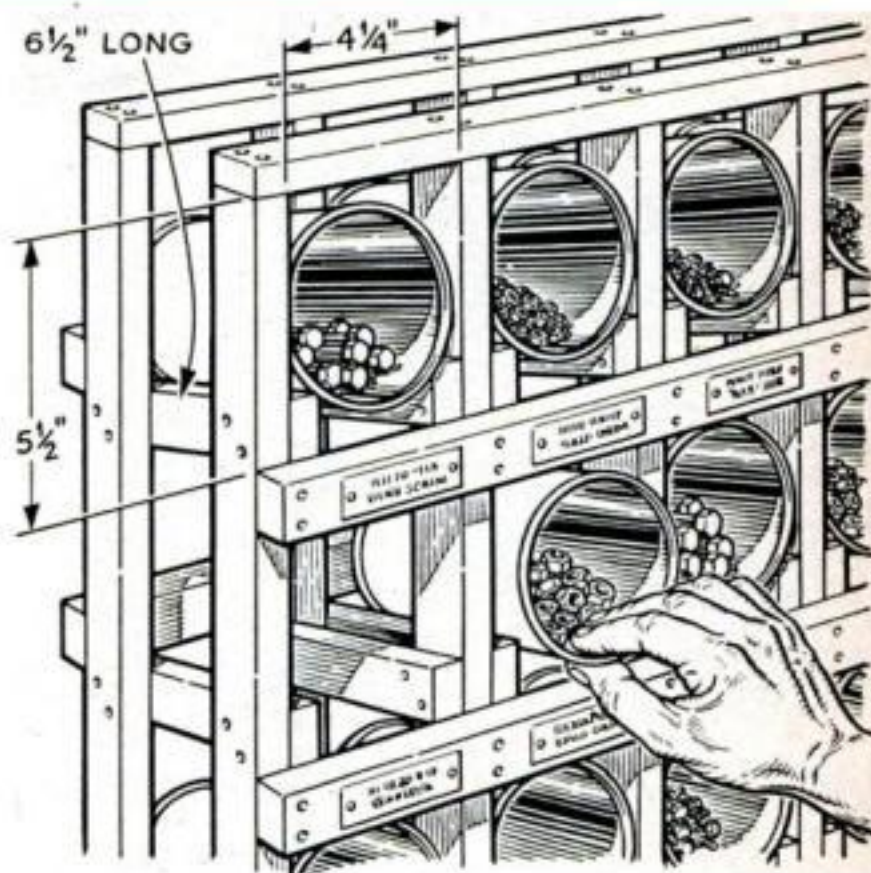


Hints from the Model Garage



STATIC-COLLECTOR
BUTTON IN HUB CAP

Lubricating Static Springs. When wheel springs are used to prevent static interference with radio operation, apply heavy graphite grease occasionally to the axle end. To make conductive grease, mix powdered graphite with petroleum jelly.

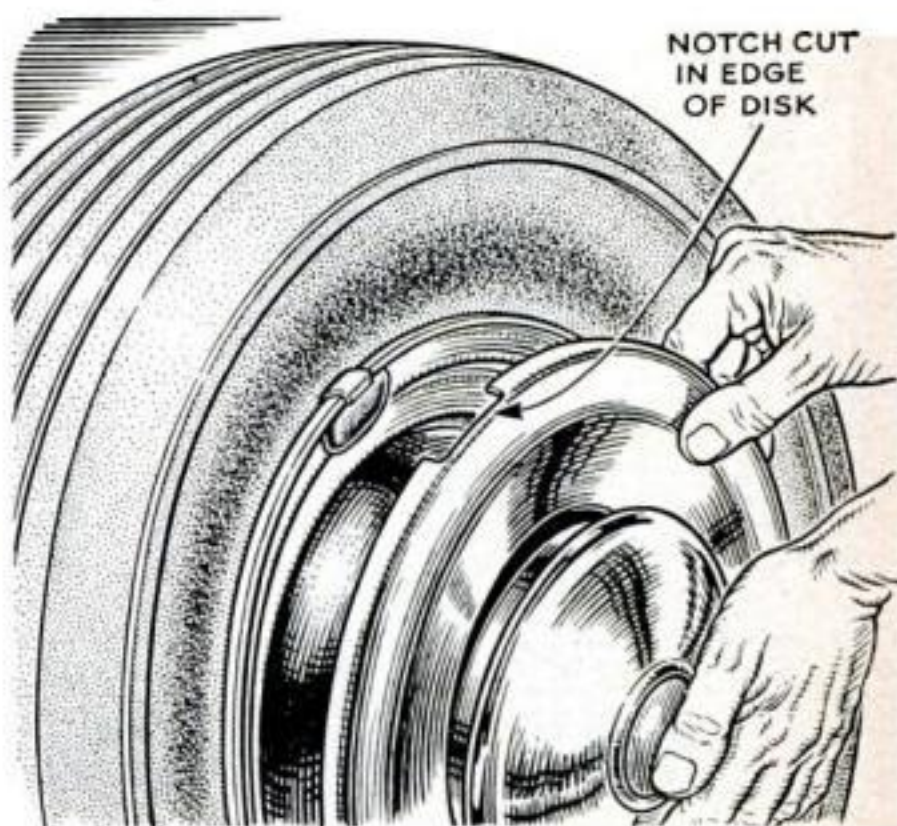


Small Parts Stored in Oil Cans. A rack for nuts, bolts and other small parts can be assembled from empty quart oil cans and cheap lumber. Build it so cans slope toward the back. The containers can be lifted out and carried to the job.



TARGETS
PAINTED ON
BACK WALL

Targets Help Space Cars. While A. Zanelli, of Wyckoff, N. J., was renting a two-car garage to a couple of neighbors, one of them occasionally took too much room, blocking out the other. As a solution—and reminder—Zanelli painted a couple of alignment targets on the garage wall.



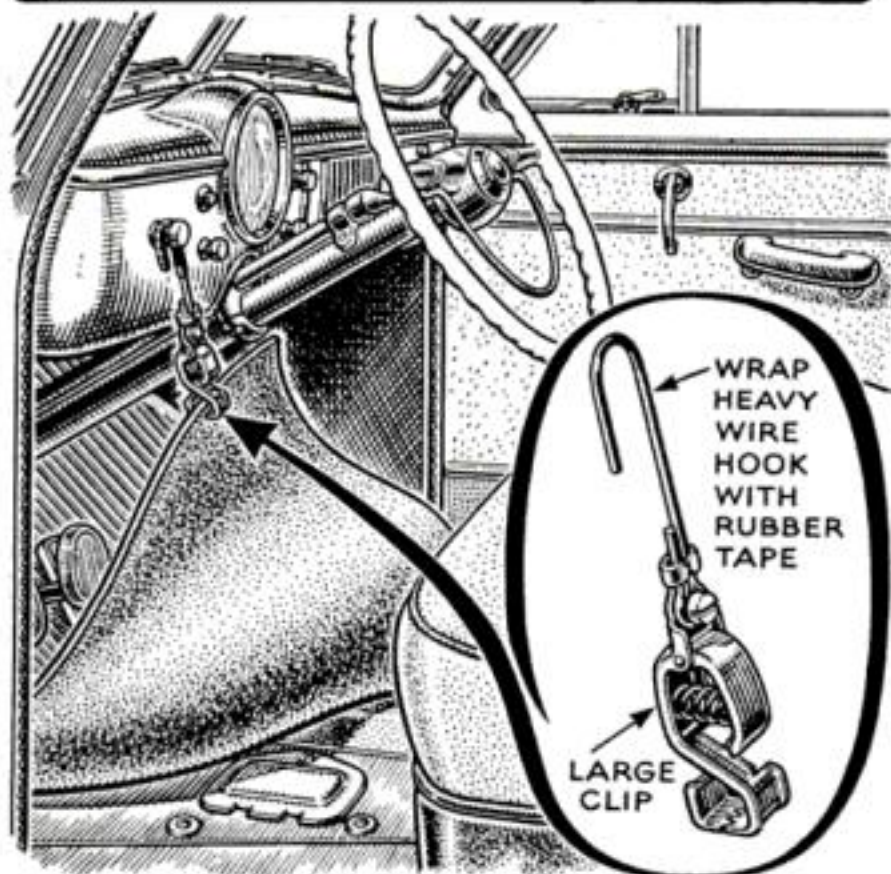
NOTCH CUT
IN EDGE
OF DISK

Fitting Disks Over Wheel Weights. In many cases, a garage man will tell you: "Use either wheel disks or balance weights—but not both." But you can make the disks fit over the chunks of lead by hacksawing out small slots. The light disks will not ordinarily disturb wheel balance.

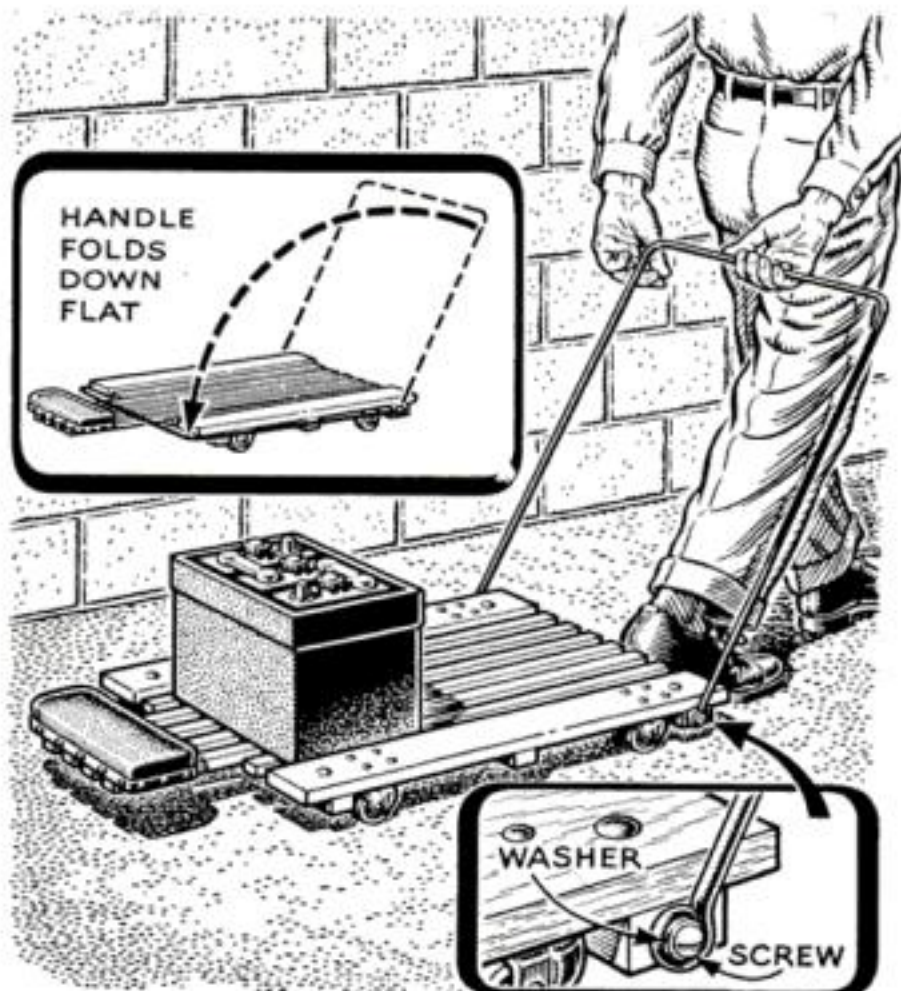
Please turn the page for four more hints.

NOVEMBER 1951 199

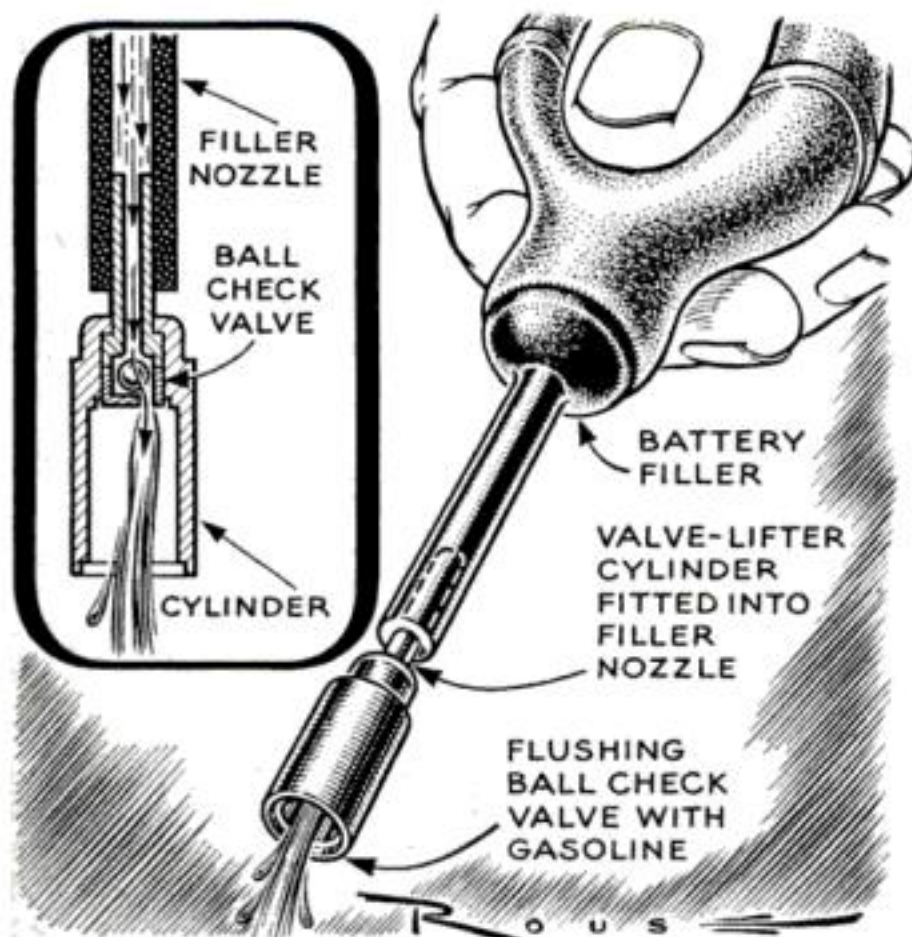
MORE Hints from the Model Garage



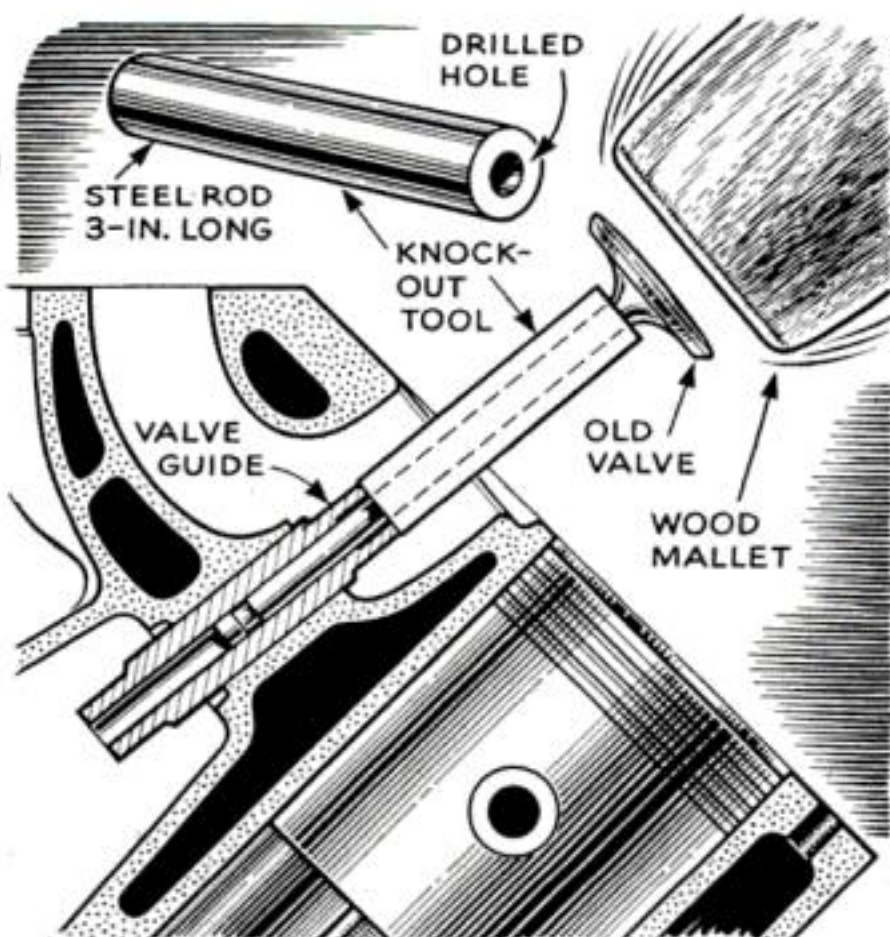
Mat Clip Leaves Your Hands Free. A clip like this will keep the mat out of the way when you're working on a master brake cylinder or battery under the floor. Hook it over one of the dashboard control knobs. A spring-closed battery clip does fine.



Creeper Hauls Batteries. Instead of totting heavy storage batteries, one mechanic moves them on a creeper fitted with a handle of $\frac{1}{2}$ " cold-rolled rod. Swung down, the handle doesn't interfere with normal use of the creeper.



Syringe Cleans Hydraulic Lifters. If you aren't satisfied with the usual method of soaking in gasoline to clean hydraulic valve lifters, try this: Draw clean solvent into a synthetic-rubber battery syringe, fit it to the lifter stem, and force fluid through. Shake the unit as a test; the ball should make a sharp click.



Tool Knocks Out Valve Guides. Worn valve guides can be removed and new ones installed in some engines by using an old valve and a piece of cold-rolled steel. The outside dimension of the knock-out tool should be slightly less than that of the valve guide, the inside drilled to the same dimension as the valve stem. Use as shown.

MEET MR. RAT. He has plagued man since prehistoric times. 15½" long when grown, with 7½" tail, he weighs up to 12 ounces. He invaded America from both coasts before the Revolution.



New Poison Fools Rats

Warfarin is tasteless and painless, so a rat's cunning cannot save him from this new chemical exterminator.

By Gardner Soule

THERE are more rats than people in this country now—the experts say—but the rats are being liquidated rapidly in many areas by a new poison called warfarin.

A tasteless, odorless powder, warfarin has been in use for 18 months. In this brief

period, it is credited with killing 20,000,000 rats.

Here are a few of the victories scored by this new chemical exterminator:

- In New Jersey, a man bought an old farmhouse. Rats had moved in first. He used warfarin.

"The first bait was entirely eaten, one pound; the second, ditto; the third, 50 percent, all these at 24-hour intervals. The fourth was apparently not touched. I have lived here for months since and have not

Cleanliness Is Important

SANITATION is the first step against rats. In Baltimore, a simple clean-up of city blocks reduced the rat population by two-thirds—it eliminated food and shelter for rats and forced them to move on, to fight and kill each other, or to die in their burrows.

Around a home, sanitation means a garbage can with a tight cover, no clutter in attic or basement, and such things as:

KEEPING bird food on raised platforms and off the ground.

RIPPING out dark, enclosed places under floors or stairs where rats may live.

RAISING lumber, pipes, other stored material 24" off ground.



HE FIGHTS The Norway rat has almost exterminated the smaller black rat; he fights other Norway rats over food supplies (above); he eats his relatives; he also fights for no apparent reason. He thrives where garbage cans are left open.

HE EATS corn in the crib, in the fields, in the mill. He eats fruits, potatoes, vegetables; chicks, eggs; bulbs, leaves, stems of flowers. He picks a well balanced, vitamin-rich diet. U. S. rats each year destroy as much food as 10,000,000 people eat.

seen a sign of or heard a rat," he reports.

● In Ohio, warfarin was tried in several locations, apparently eliminated all rats, and was left out in bait stations. "The value of this procedure," the Ohioans say, "has been evidenced in several cases where the premises are still free of rodents several months later."

● In the South a dairy, plagued by rats for years, used warfarin. In a few weeks, 8,000 rats were wiped out. Now the dairy has no rats and only a few rat visitors, which warfarin kills.

The Farmer's Friend

Throughout the U. S., especially on farms (where the rat population is heaviest), men who have seen rats or signs of them are putting out warfarin-poisoned bait. Warfarin used as a dry bait does not freeze; it can be used all winter long, when the farmer,

with his crops in, has time for a major drive against rats.

You can buy warfarin in two forms: Ready-mixed bait (0.025 percent warfarin), and warfarin concentrate (0.5 percent) to be mixed in foodstuffs for bait. The ready-mix costs from \$1 to about \$1.60 a pound. One pound is enough for a lightly infested home (about four rats); five pounds is enough, as a rule, for a lightly infested farm (20 rats).

Warfarin concentrate is mixed with 19 parts of a food—yellow corn meal, freshly ground yellow corn, rolled oats, nut crumbs, laying mash—to make bait. Dry cereals are mostly used because they are readily eaten by rats, because they are not readily eaten by pets and children, and because they remain palatable—if kept dry—for some time. The bait is put out in bait stations to keep it dry, and to keep children and domestic



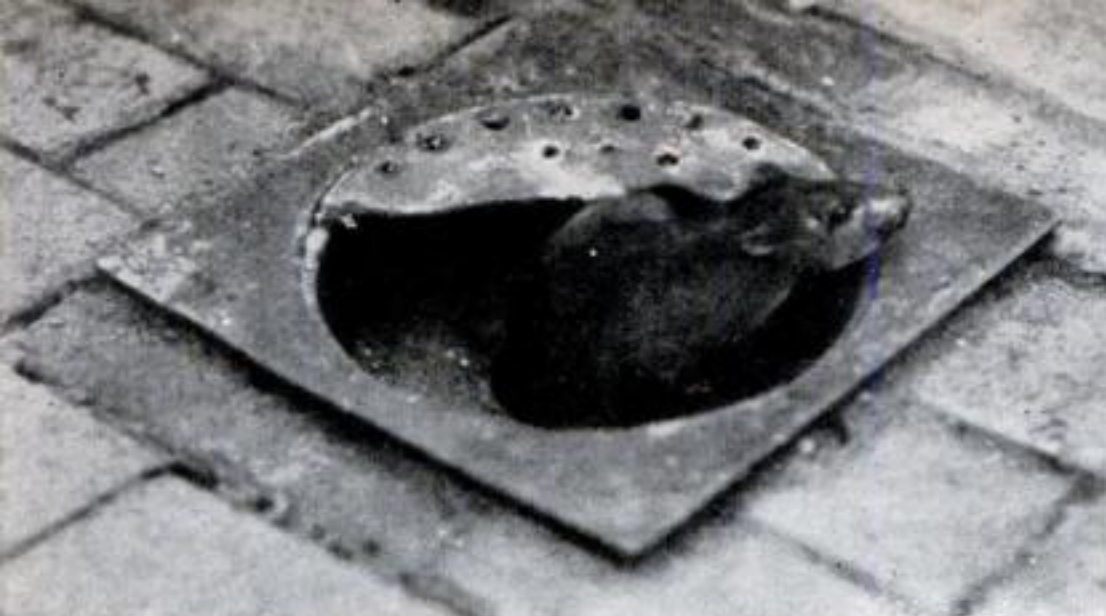
1. Place cereal bait in can or drum. Empty warfarin concentrate (one part to 19 of cereal) into drum or can, on top of bait material. Replace cover of the drum.



2. Shake can thoroughly, or roll it along table. Open, remove sample on mixing paddle. Smooth on paddle. If streaks of color show, shake the can again.



3. Mixing is complete when there are no streaks left. Put bait almost up to the tops of empty, dry coffee tins, crocks, fruit-jar tops or pie tins.



HE GETS IN He can wriggle into a home through an opening less than an inch in diameter. A basement drain is a highway for him if it is left open or only partially covered (above). He can also sneak in through broken window panes.



HE GNAWS Rats have four chisel-edged incisor teeth (two up, two down) that grow all during his life. He must gnaw to keep them worn down. He gnaws door edges, makes an entrance. He gnaws wiring, lead pipes, oak, even concrete.

Photos from U. S. Fish and Wildlife Service

animals from spilling it and from eating it.

Warfarin is poisonous to all warm-blooded animals if taken in large enough doses on successive days. Some animals have been killed by it, but advocates of its use say no human deaths from it have been reported. Since it is new, common-sense precautions should be taken.

It's for Rats Only

The poison should be placed where only rats can get it. Hogs may be poisoned by it. And a cat or dog that eats warfarin-killed rats for four or five consecutive days is likely to die from the stomach contents of the rats. It is best to bury the dead rats.

Rats often pass up warfarin bait the first night, and persons who expect immediate results are disappointed. A rat is suspicious of anything new, and will usually shy away from a bait station for a night or two, until



HE CAN BE STOPPED as by a screen. Then he may have to migrate. Otherwise he lives all his life (1 to 2½ years) within about 100 feet of his burrow, which is located in ground, refuse heap, stored goods, walls.



4. Use clean equipment for mixing and for holding bait in traps. Never mix warfarin with other poison. Bait containers must be 3½" or less in height.



5. Use bait boxes or stations to keep bait from children, cats, dogs, livestock, and to keep bait dry and uncontaminated. Build the stations from waste lumber.



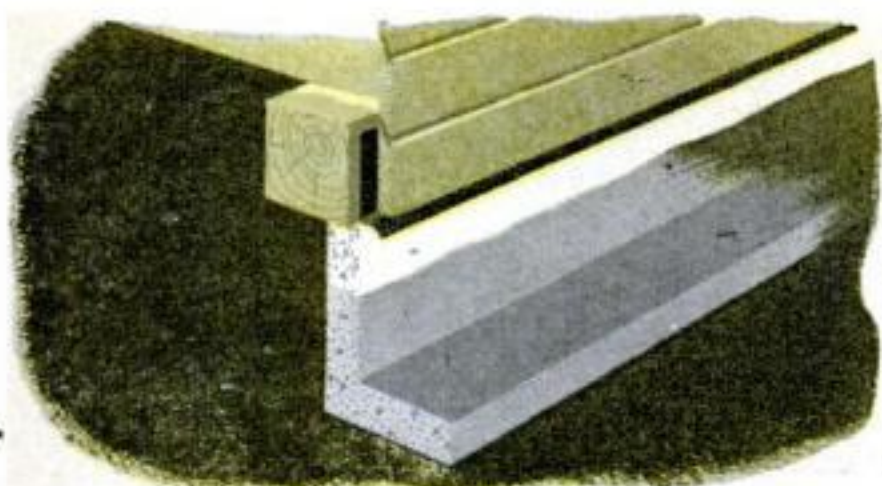
6. Simplest bait station of all is piece of lumber 5' by 8". It is nailed against wall—rats hug the walls for protection. Put some water nearby. Water helps attract rats.



7. Sift white flour on the floor or on ground around the bait stations. Watch for tracks. If there are none within three nights, move the bait station.

BUILD 'EM OUT That's the exterminator's term for rat-proofing your home or any other building. When you build them out by using concrete and metal, rats have no way of getting in to food—a sure

way to cause them to migrate. But to be sure of complete freedom from rats, you should follow all these rules: keep your premises sanitary; ratproof your buildings; *and* use traps and poison to kill rats already there.



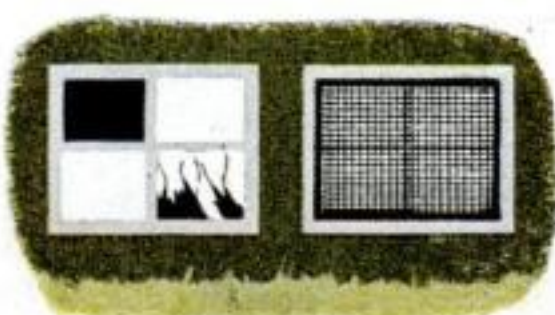
Install concrete curtain wall to prevent rats from burrowing under building. Curtain wall does not support building.



Seal cellarway with concrete to block out rat burrow and to make the stairway completely ratproof.



Put metal flashing on gnawed or rotted doors. A rat can go through space $\frac{1}{2}$ " square.



Screen basement windows—all of them. Replace any broken window panes.



Close foundation openings $\frac{1}{2}$ " or larger with metal collars, shields or masonry.

he has inspected it closely from all angles.

One dose of warfarin does not kill a rat. But he returns to eat again and again, and when he has consumed 36 percent of his body weight of the warfarin-dosed bait, the condemned rodent has had his last meal. Since a rat eats 10 percent or more of his weight each night, and probably takes other food besides the bait, it usually takes four or more nights' feedings to kill him.

Nothing drastic happens to the rat the first two days. On the third or fourth day, he starts to bleed internally and this continues until he bleeds to death. His capillaries (the smallest blood vessels) are broken down. Then warfarin prevents his blood from clotting. This is internal; often a dying rat shows no blood outside his body. Because his blood system has no sensory nerves, he dies without pain.

Warfarin is effective because the rats don't know what's happening to them. This may be because it is odorless and tasteless. It may be because there are no external symptoms, like bleeding or spasms. It may be because there is no pain. So the rat, who is dying from a hemorrhage around the heart,

from suffocation due to lung hemorrhage or from exhaustion due to lack of blood to carry food to tissues, continues to eat the bait—even when he has to drag himself slowly to it—until the end.

Other Poisons Kill Quicker

Where quick kills are wanted, other poisons are likely to be more effective. They are often used, in fact, to thin out the rat population before warfarin is set to work. They should not be mixed with warfarin; if they are, the rats may quickly learn what is killing them and avoid the bait.

Antu is an effective poison on initial use (PS, April '47, p. 91). It is poisonous to hogs and dogs; not very harmful to men and poultry.

Red Squill comes as a liquid (warfarin does not) as well as in powder form. It does not harm domestic animals. *Red Squill* makes a domestic animal (or a man) vomit. The rat cannot vomit.

1080, the most powerful rat poison, does the best job of getting rid of rats in a single night. But it is so deadly to men as well as

[Continued on page 246]

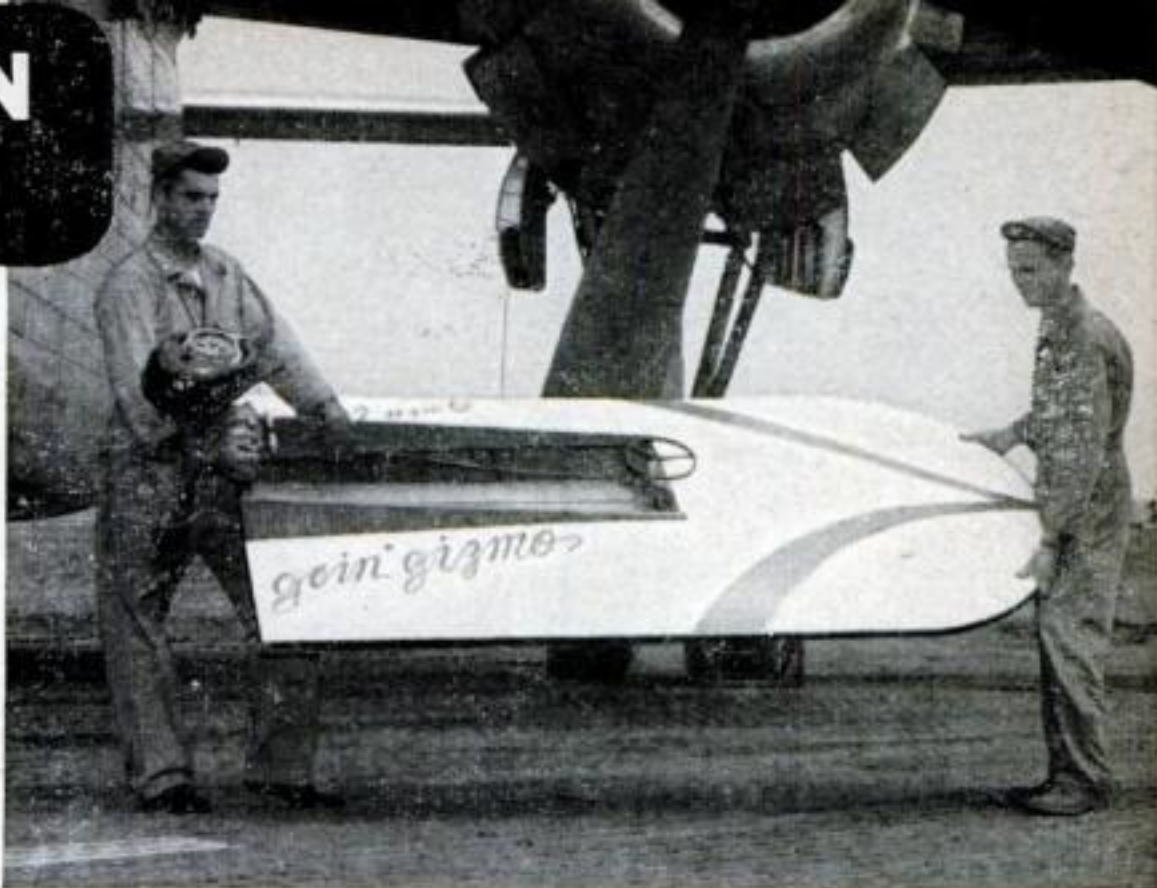
CRAFTSMEN AT WORK

Boat Built from PS Plan.

Two pilots on the Korean Airlift have been shooting around Japanese waters in a Flying Saucer—POPULAR SCIENCE style. The photo shows a racing hull built by Lt. W. E. Buckley, Murfreesboro, Tenn., and Lt. H. S. Britton, Dayton, Ohio, from plans published in PS last February.

But instead of calling it the Flying Saucer, they have named their boat the Goin' Gizmo.

The project began when the pilots acquired a 4½-hp. outboard motor. Gestures and a mixture of English and Japanese got



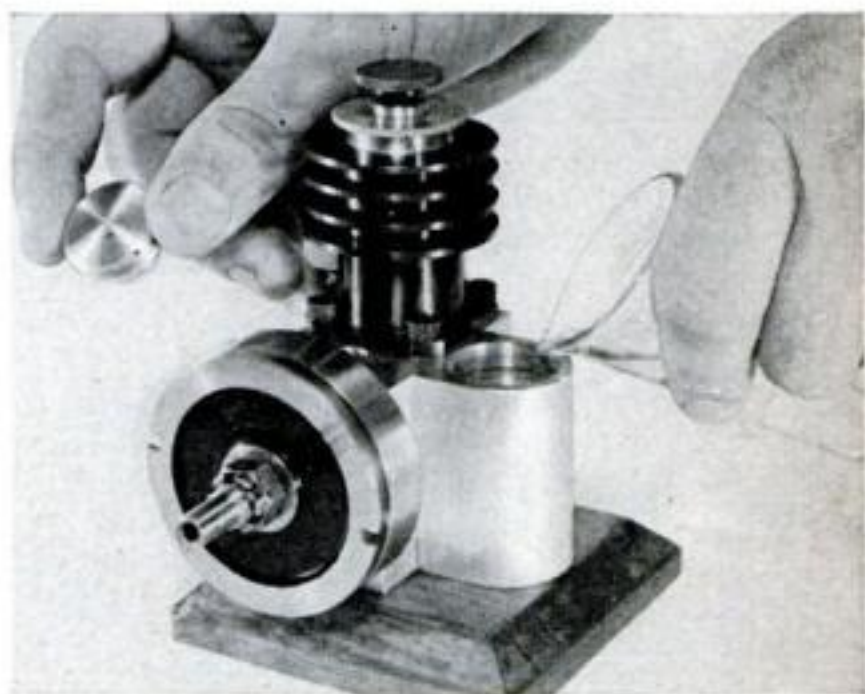
some Japanese boatbuilders started on the hull.

When the craft was finished, the pilots found the 4½-hp. motor didn't turn up enough speed, so they borrowed a 10-hp. job. Now they skip around at 40 m.p.h.

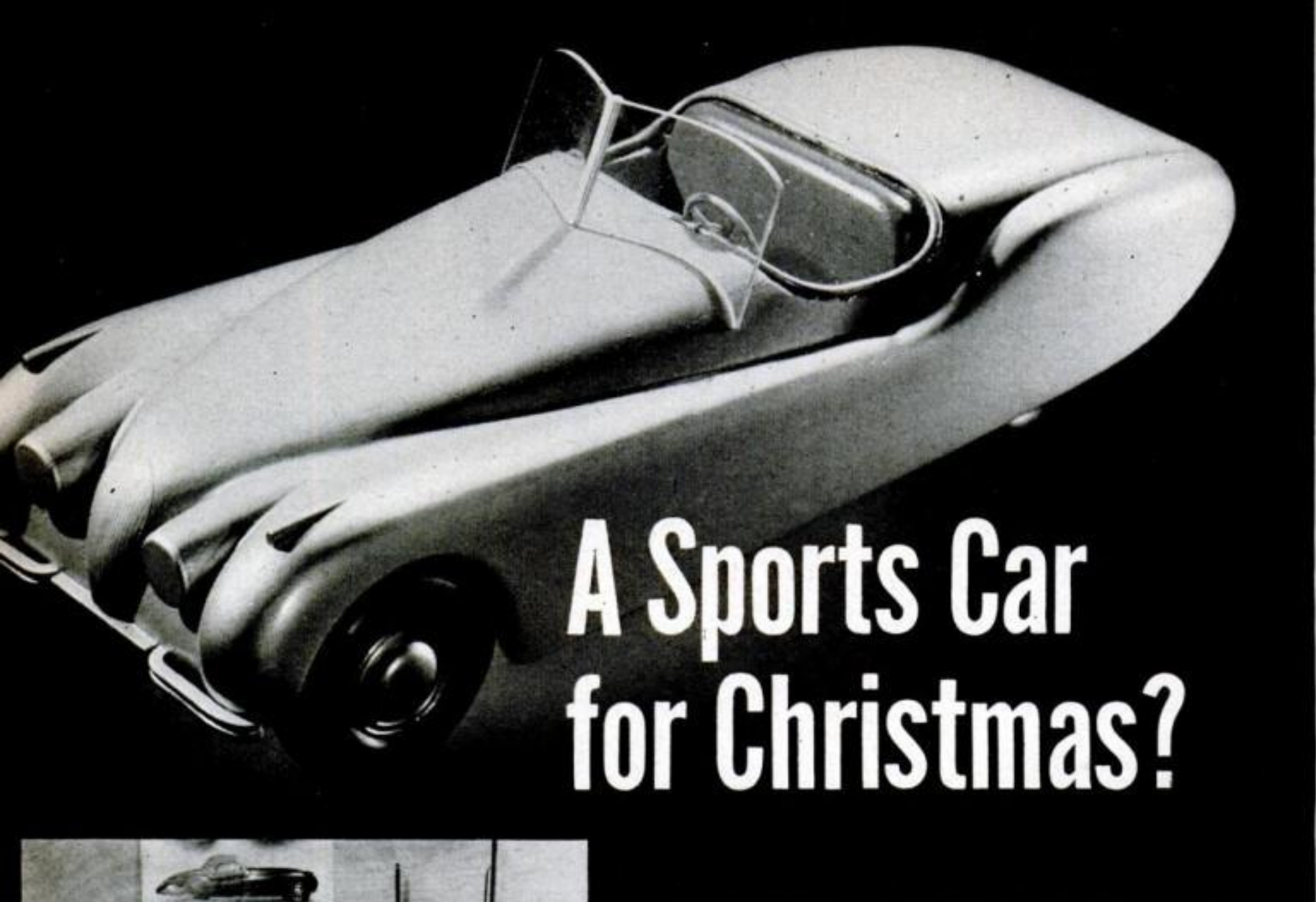


Secretary Builds Furniture. When Secretary of State Dean Acheson has a chance to get away from it all at his Maryland farm, he's likely to relax by making fine furniture. In his well equipped woodworking shop at the farm he has turned out many products, but this Pennsylvania Dutch china cabinet, shown here in the farmhouse dining room, is his most ambitious piece.

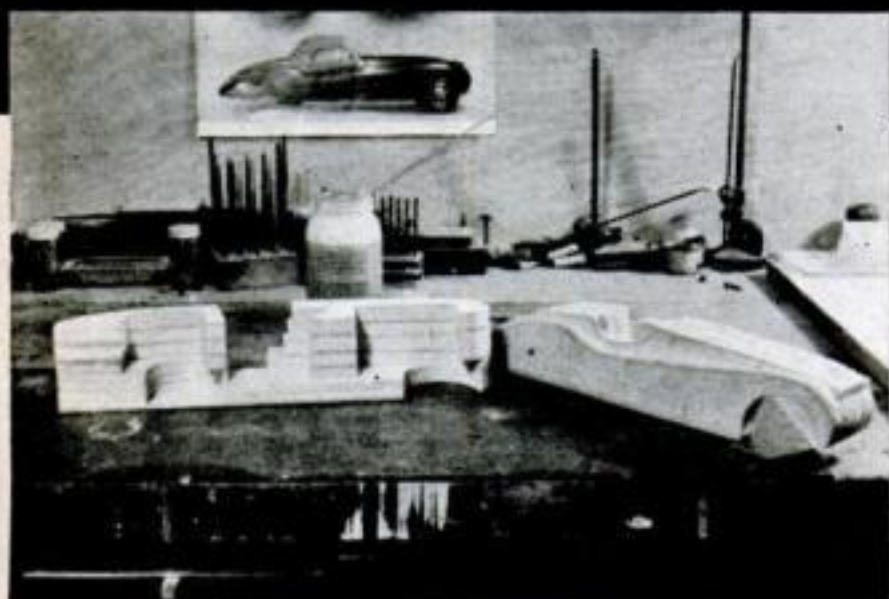
Static Generator Shoots Sparks. This model of a Van de Graaff electrostatic generator was built by C. C. Frankenfield, Newark, Del., from PS plans (Oct. '46, p. 188). A silk belt that runs up and down inside the column generates static electricity. Static sparks can be drawn from the copper ball. It makes an electric "breeze" strong enough to blow shredded paper.



Model Diesel. Lathe and drill press were put to good use by Weldon T. Golden, Jr., of Portsmouth, Va., in building this slick two-cycle engine. The cylinder dimensions are "square"—both bore and stroke are ¾". It has a rotary valve, adjustable compression, runs on home-concocted fuel, has been clocked at 7,000 r.p.m.



A Sports Car for Christmas?



Jigsawed sections are glued together to form the body. Left and right sides are cut to identical patterns. By jigsawing and gluing flat pieces, you eliminate most of the carving.

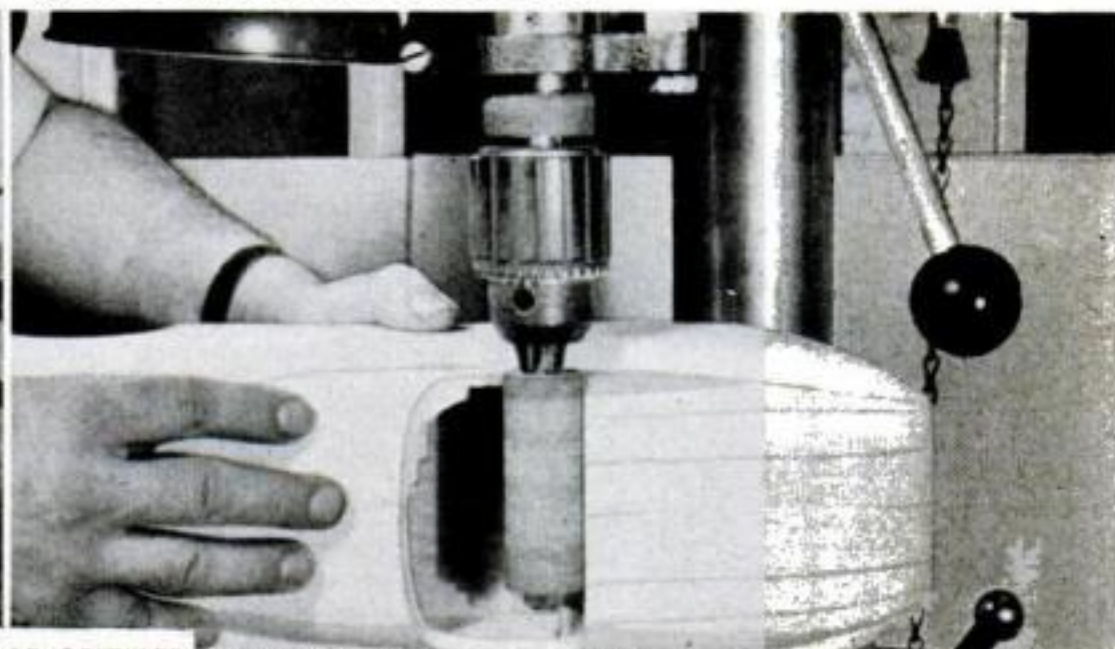
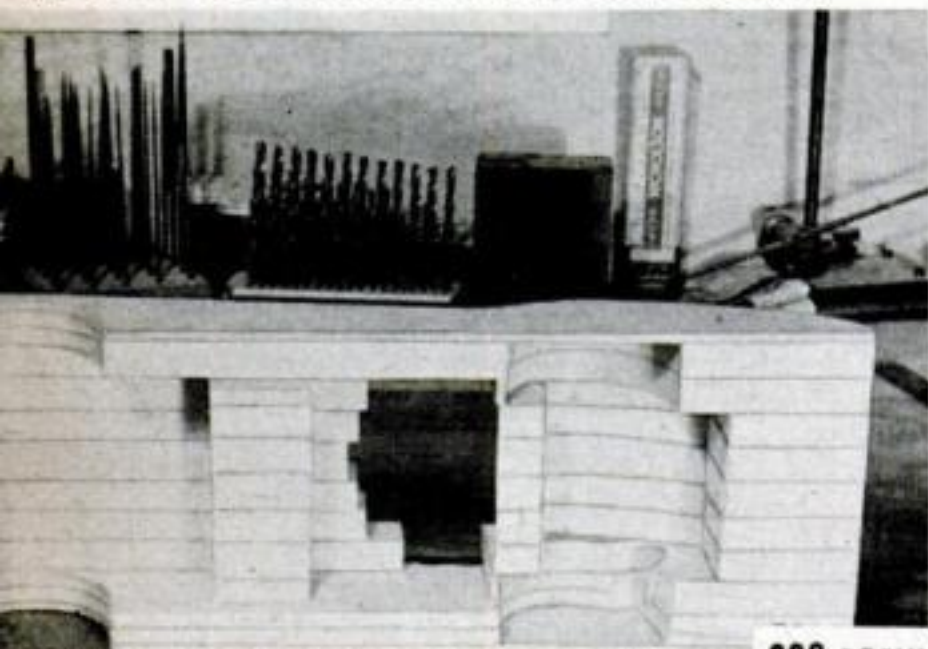
The bottom must be accurately shaped to provide clearance for motor and wheels. Chassis board fits inside and is screwed to square projections in front and back of driver's seat.

Got a yen for a Jag? For pennies instead of pounds you can have a miniature of the British speedster.

By Herbert Pfister

THE Jaguar XK 120—England's super sports car—comes as close to flying as anything that rides the ground. With twin overhead camshafts, it can top 125 m.p.h. or amble through traffic like a baby carriage; it can rocket from rest to 100 m.p.h. in less

A sanding drum in a drill press will do a quick, clean job around the driver's compartment. It is particularly good for shaping the gentle slope of the elbow rest.



than half a minute and it can brake to a fast skid-free, road-hugging stop. The Jag two-seater has set sports-car performance records, and yet it is famous for its smooth, comfortable ride.

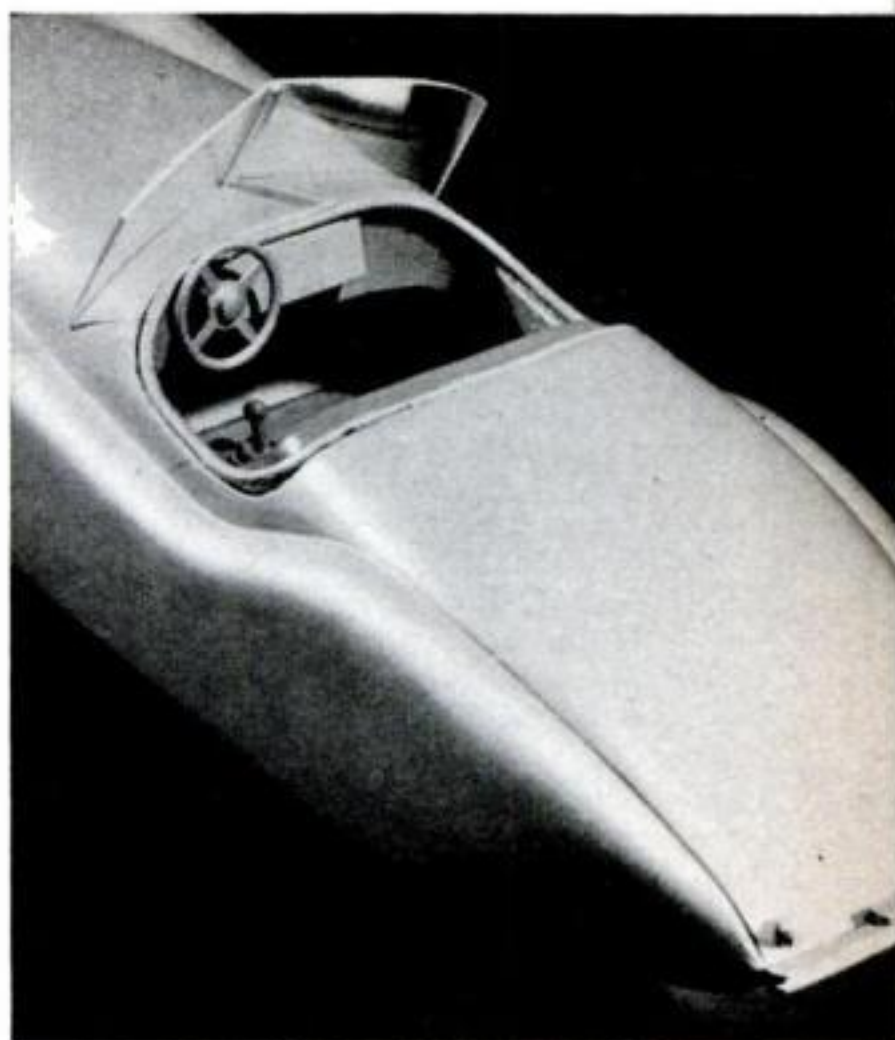
It takes about \$4,000 to buy this package of streamlined dynamite, but you don't need money or even a lot of modeling skill to enjoy a carbon copy. Pictured here is an accurate scale model that also has a simplified running gear that lets you see the Jag in action. It is easy to make this model because you do 90 percent of the carving with a saw.

Steering Wheel Is Clock Gear

The drawings on the following pages show the steps by which you build up the body and chassis. For the details of trim and finish, you can improvise from parts on hand. The steering wheel is an example. Instead of shopping around for a ready-made wheel, I used a four-spoke clock gear. I dropped a blob of solder on the hub, chucked the wheel in an electric drill, and turned the solder against a file to form a round, smooth horn button. To complete the wheel I slit open a length of fine radio "spaghetti" and cemented it around the rim.

Rather than waste time turning the wheels, I picked up four model-plane wheels, complete with tires. For the front hub caps I used plated furniture glides—the kind with a center brad or tack. I cut the brads short and drove them into under-size holes drilled in the axle ends. The rear wheels do not need hub caps because they are covered by the fender skirts.

Before applying the finish I removed all



The trim lines of the Jaguar are copied faithfully in this model. And you need only "shift" the switch lever to see the Jag take off.

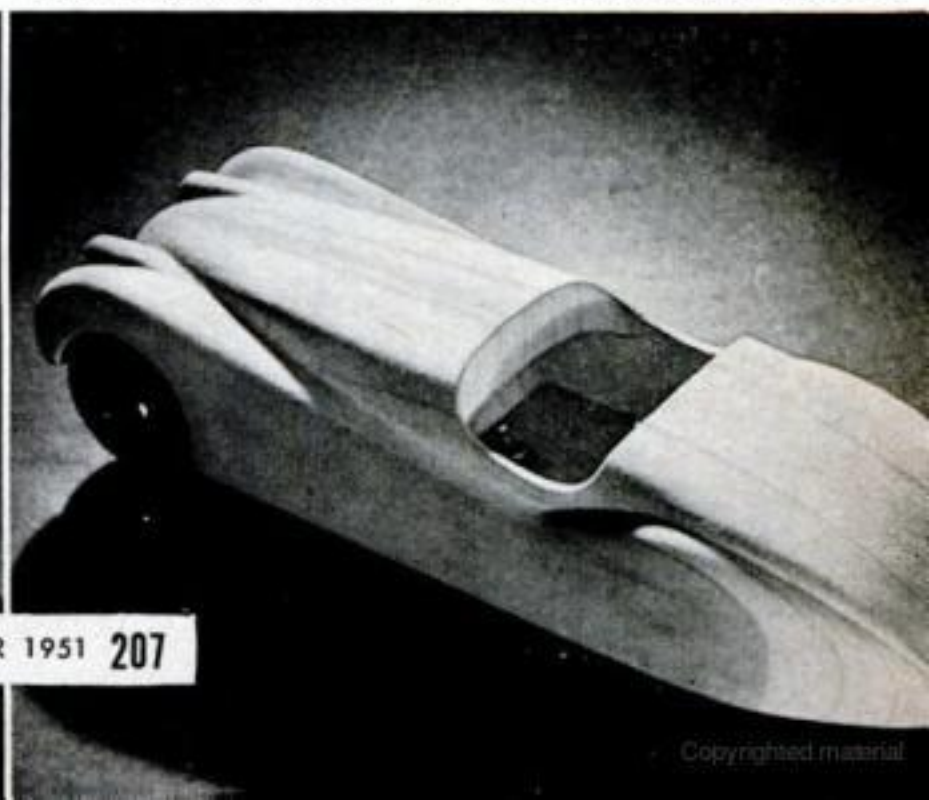
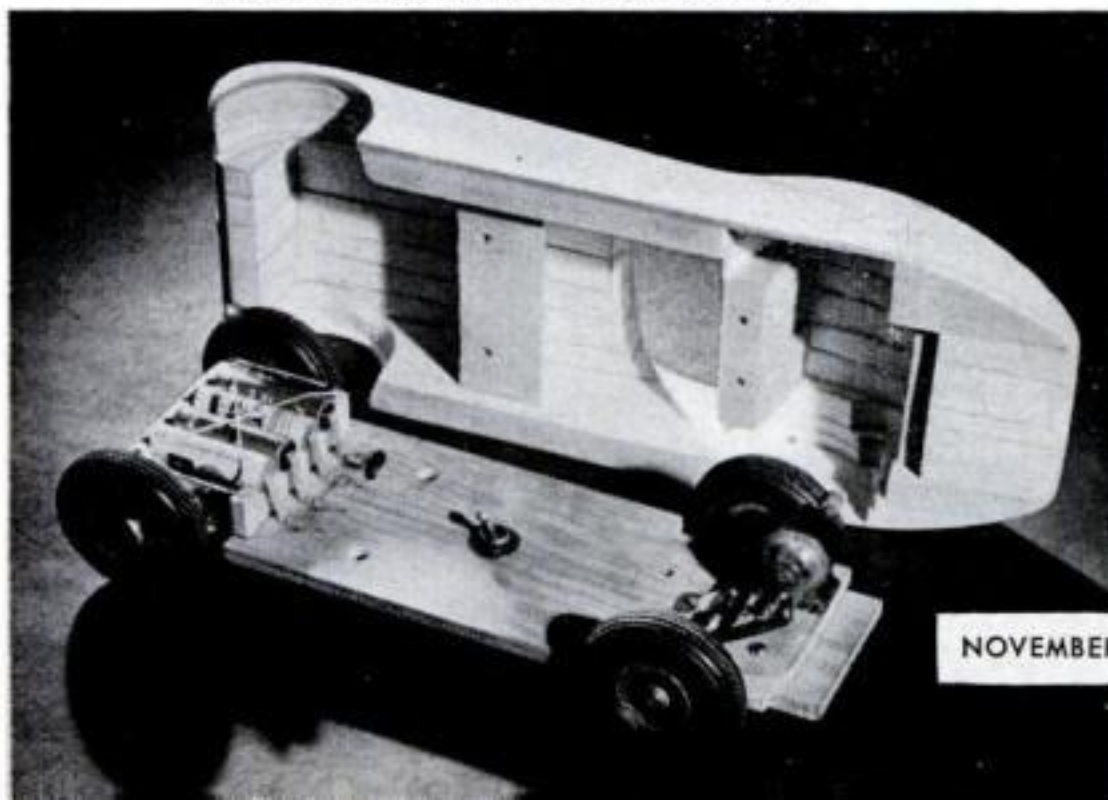
the trim and separated the body from the chassis. I brushed on several coats of lacquer sealer to fill the grain and sanded between coats and after the last one until the shell had a glasslike surface.

For the final coat I used regular model dope. I made the body color a metallic gray by mixing 95 percent silver with 5 percent deep blue. I used plain silver on the windshield edges, bumpers, headlight lenses and grille. I painted the seat and back rest dark gray and dabbed two little circles of red on the tail lights. Start now and you'll have the Jag under the tree Christmas morning.

Please turn the page for working drawings of the Jaguar.

Electric power plant is simple and inexpensive but has a lot of pep. Toggle switch, front and center in the driver's compartment, takes the place of real car's gearshift lever.

Smooth flowing contours that have made the Jag famous show up on model as soon as it is assembled, even before finish is applied. Note four exposed layers of wood past rear wheel.



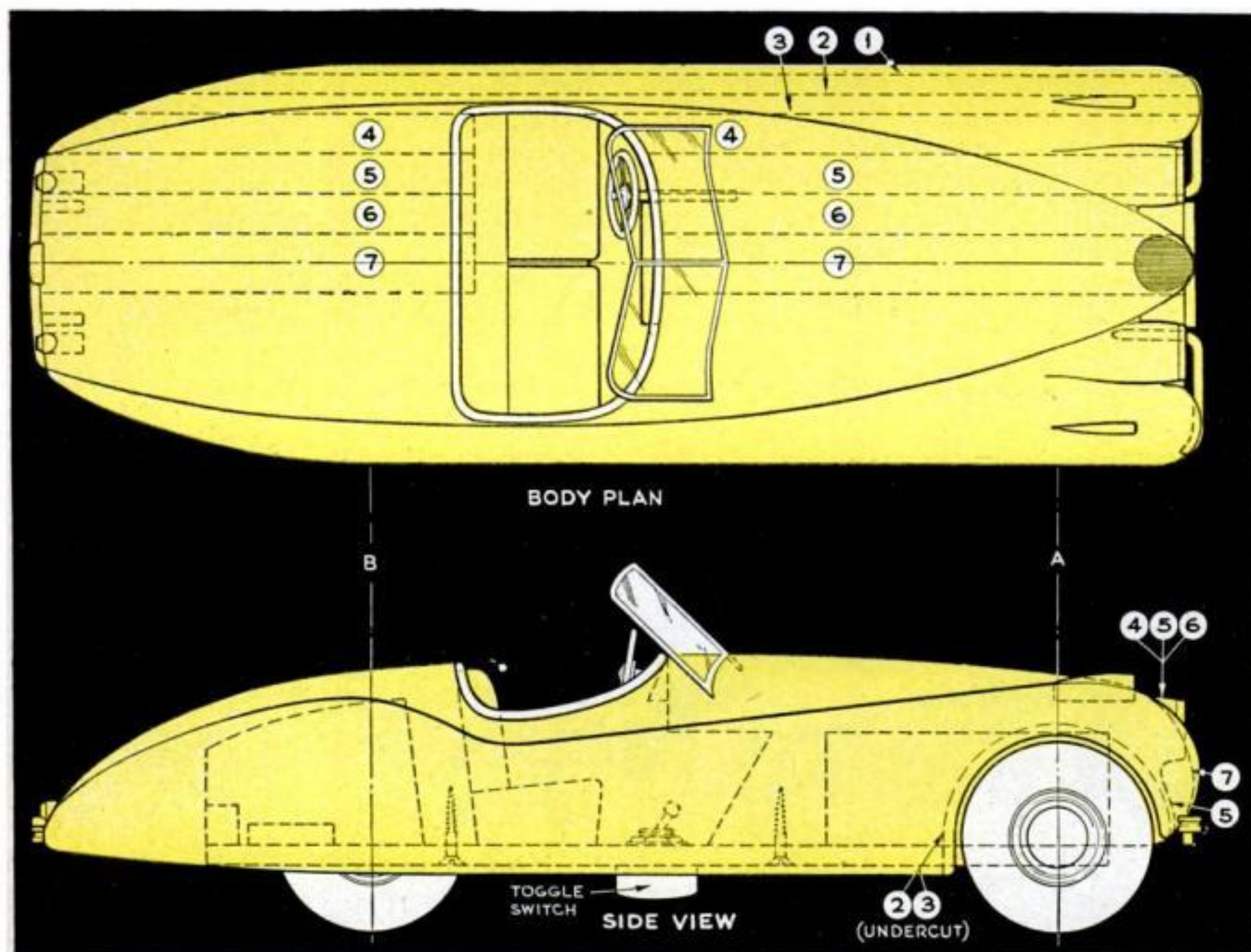
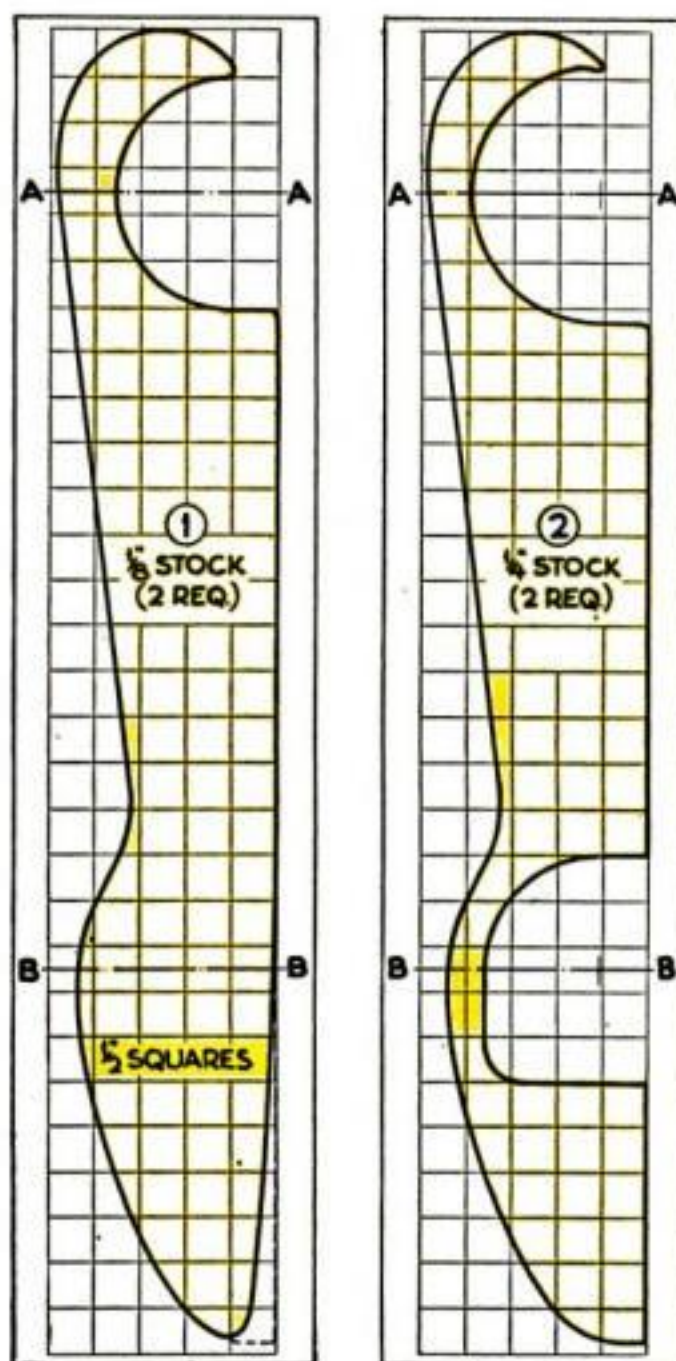
The body is made up of 13 sections jigsawed to the seven patterns shown at right. Using either clear pine or hard balsa, saw off 3" by 15" pieces of differing thicknesses: make two pieces $\frac{1}{8}$ " thick, six $\frac{1}{4}$ ", and four $\frac{1}{2}$ ". You will need a thirteenth piece for the center (section 7) but don't saw it off just yet.

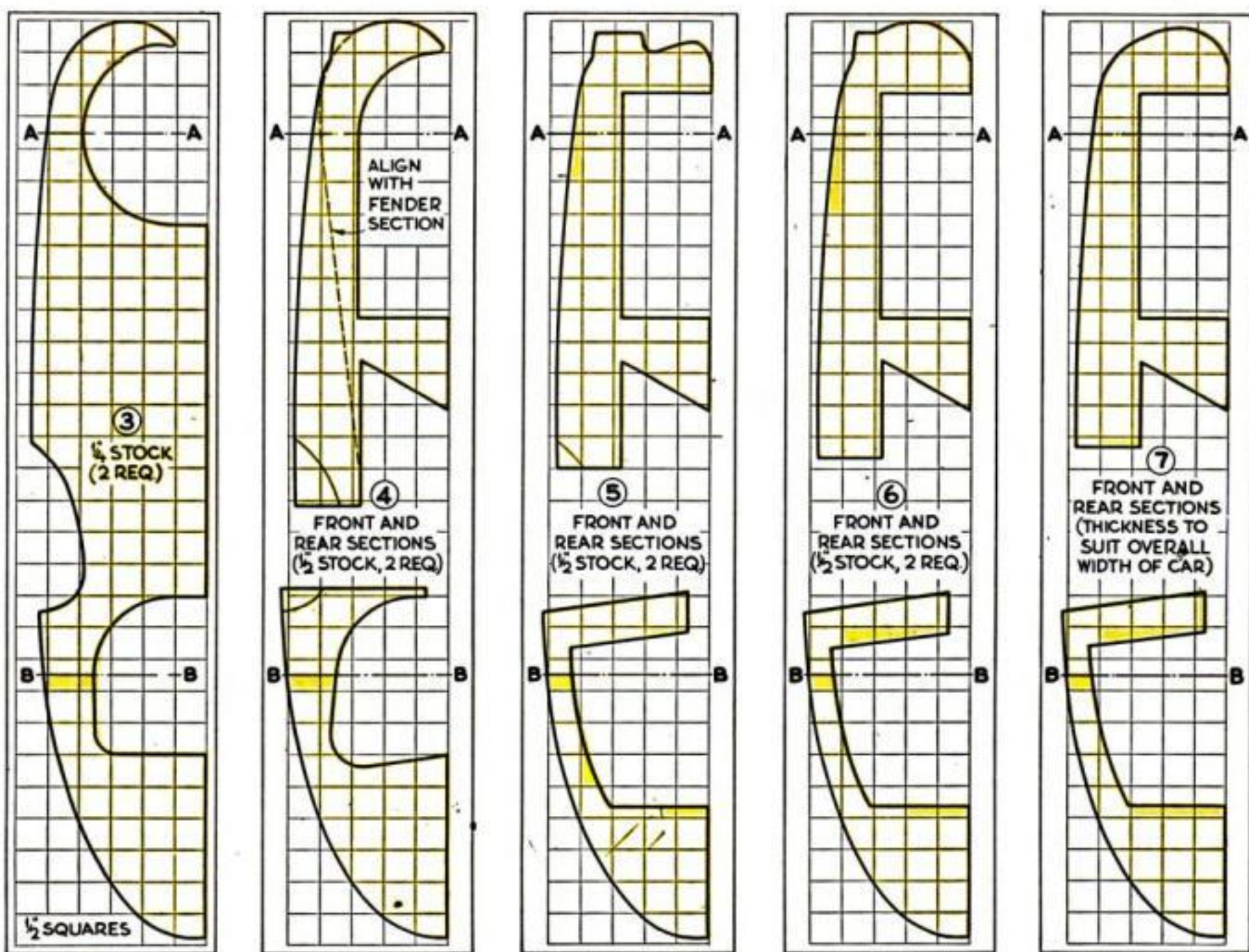
Enlarge the outlines, trace them off onto pieces of suitable thickness, and saw the individual sections. Make two each of sections 1 to 6 and glue up separate sets, joined in numerical order. Measure the combined width of both sets and cut a piece for section 7 to whatever thickness you need to bring the finished width of the body to $4\frac{1}{2}$ ". The glued-up sections have most of the body shape built in. Finish the little that remains to be done with sharp chisels and sandpaper. To get the headlamps truly round, screw $\frac{1}{4}$ " faucet washers over the fronts and use them as guides while rounding the shells. Glue bits of pine to the fenders and carve them to simulate parking lights.

Clear plastic is excellent for the bumpers, tail lights and windshield because you can carve, cut and bend it. The two front bumpers are $\frac{1}{4}$ " strips bent and grooved as shown and pressed into holes in the body. Two studs cemented to the rear bumper hold it in similar fashion. Mounting holes for the bumpers can be punched or drilled in balsa but the ones that take the tail lights (short lengths of $\frac{1}{4}$ " rod) must be round. Make these by pressing $\frac{1}{4}$ " metal tubing into the soft wood.

The V-shaped windshield is $\frac{1}{16}$ " plastic heated in the center and bent over a wood block. A strip $\frac{1}{16}$ " square cemented along the V line projects 1" at the bottom and pins the windshield to a hole in the hood.

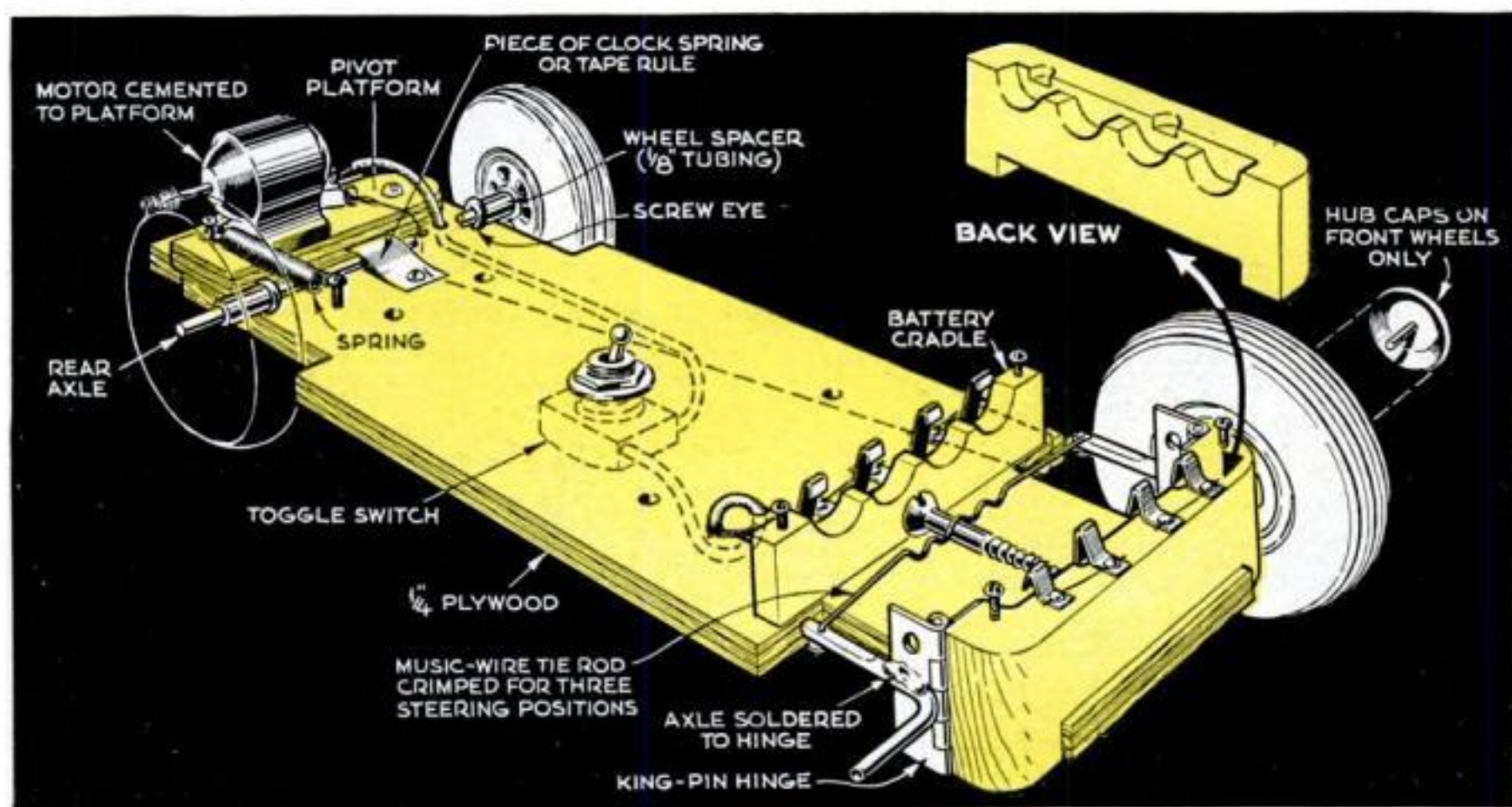
The seat, a block of balsa glued to the floor board, is divided in two by shallow file grooves on top and front. The back rest is a similar block glued to the body.





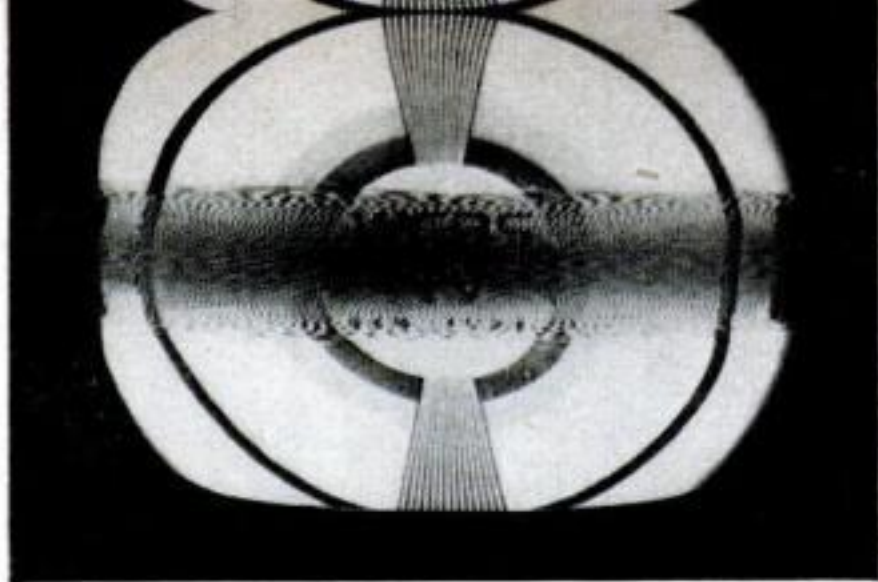
The chassis, or motor board, is $\frac{1}{4}$ " plywood. Two strips of pine, gouged to form a battery cradle, are screwed to the board. The front strip supports the "king-pin" hinges and front axles. A length of piano wire and a wood screw form the three-position steering linkage. The motor mount is pivoted on one screw and spring-loaded so the friction drive—a pencil eraser on the motor shaft—will maintain constant pressure against the rear right wheel. The

power plant is a 1.5- to 6-volt miniature permanent-magnet motor driven by four series-connected pen-light cells. The motor is cemented to the pivoted strip. The rubber-tired model-airplane wheels have $\frac{1}{8}$ " axle bearings. The axles—two in front, one in back—are $\frac{1}{8}$ " rod. The front wheels turn *on* the axles, the rear wheels turn *with* it. The ends of the rear axle are burred with cutting pliers and the wheels are driven on tight.



Homemade gadgets, made of scrap parts, can trap or filter out the flying hash that messes up many video screens.

How to Stop TV Interference

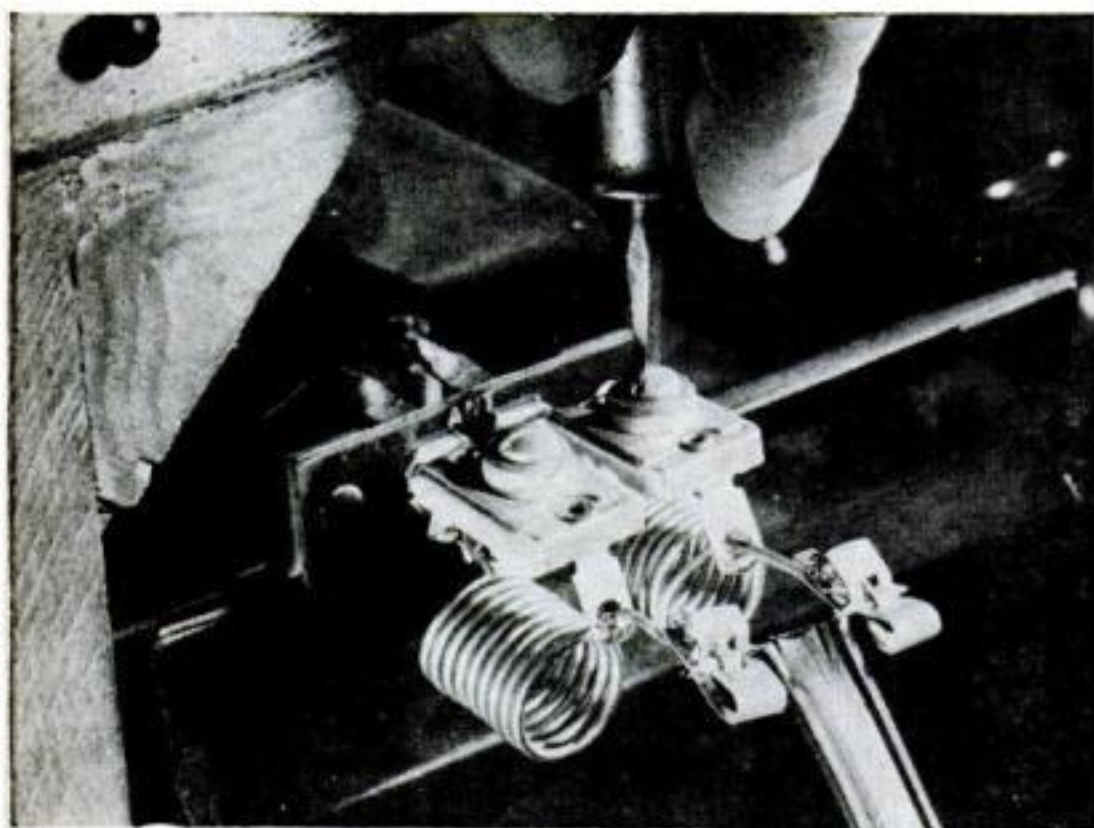


By Howard G. McEntee

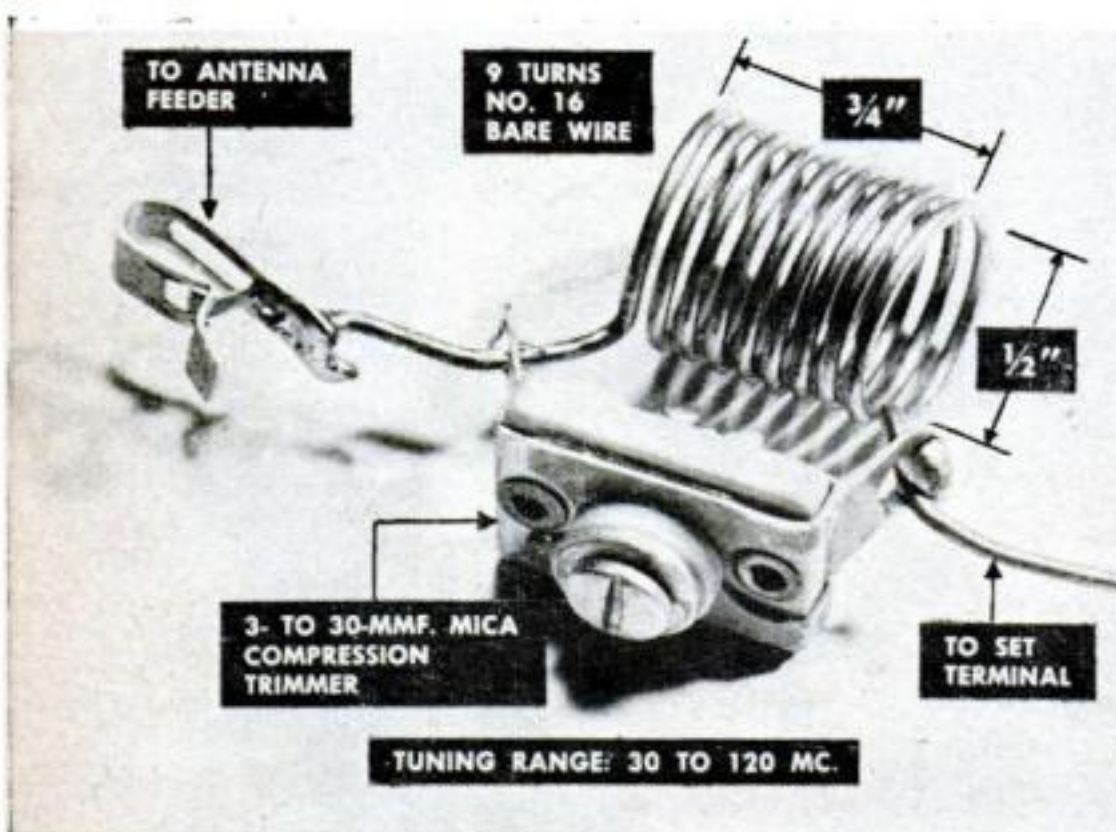
IS STATIC interfering with your enjoyment of the pictures on your TV screen? A pair of wave traps, or a filter that you can make for less than a buck, will sometimes eliminate the herringbone patterns, Venetian-blind slats, torn-up images, or shooting streaks that result from interference in television signals.

You cannot always tell in advance which of these noise-catchers will work best for you. But since they are simple to make, you can try out several of them without expending much time or money.

Traps tune out noise. Wave traps are particularly useful against the type of interference that comes from a single source and is uniform in frequency. A nearby police or ham-radio transmitter, FM station, or

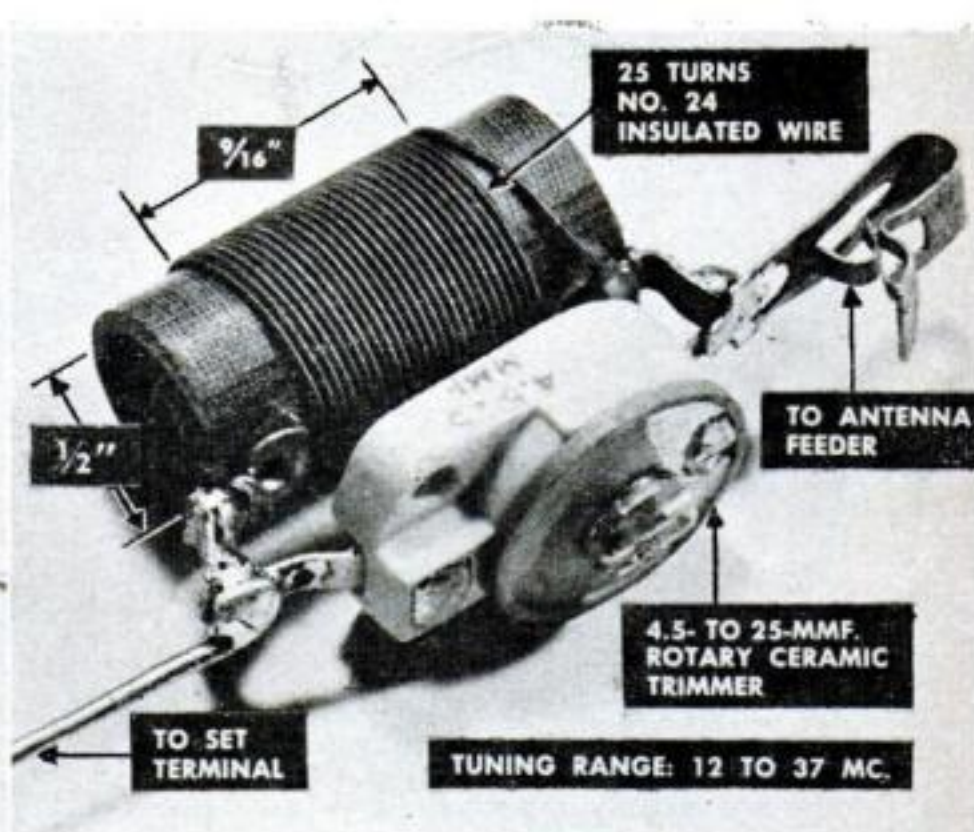


Install traps close to the antenna terminals. Use two identical traps and adjust one, then the other, until interference is at a minimum.



Wide-range trap uses 25-cent trimmer, a coil and a clip. You have to make two exactly alike.

210 POPULAR SCIENCE



A different combination of coil and condenser lowers the frequency range of this trap.

diathermy machine may be "breaking through" the tuned circuits of your receiver. Traps—which are additional tuned circuits—short-circuit the interference and help block out these unwanted signals.

First try the broad-band trap shown at bottom left of preceding page, which uses a postage-stamp trimmer. Make two identical units and insert one in each antenna feeder. Watch the screen and tune the trimmers until the interfering signal disappears. If the first pair doesn't clean up your picture, experiment with one or both of the other types shown. Since these traps cover specified frequency ranges, they may be more effective against the interference causing your trouble.

Interference sometimes sneaks into a tele-set through the power cord rather than the antenna. Traps in both legs of the power line will close off this point of entry. But be sure to mount them in an insulated box.

Filters are catchalls. Hit-and-run interference occurs even more often than the fixed-frequency kind. You can't tune it out with a trap because it skips around from one frequency to another. To get rid of it you have to block off the whole frequency band in which it appears. That's a job for a filter. The one shown at right below absorbs all signals below 40 megacycles. A lot of diathermy, police-radio, and car-ignition static falls in this range.

Arrange the coils and condensers on a plastic strip at least 4" long. (Squeezing the parts onto a shorter strip might cause the coils to interact.) Place the coils at right angles to each other. Connect the filter be-

Weak Signals Invite Interference

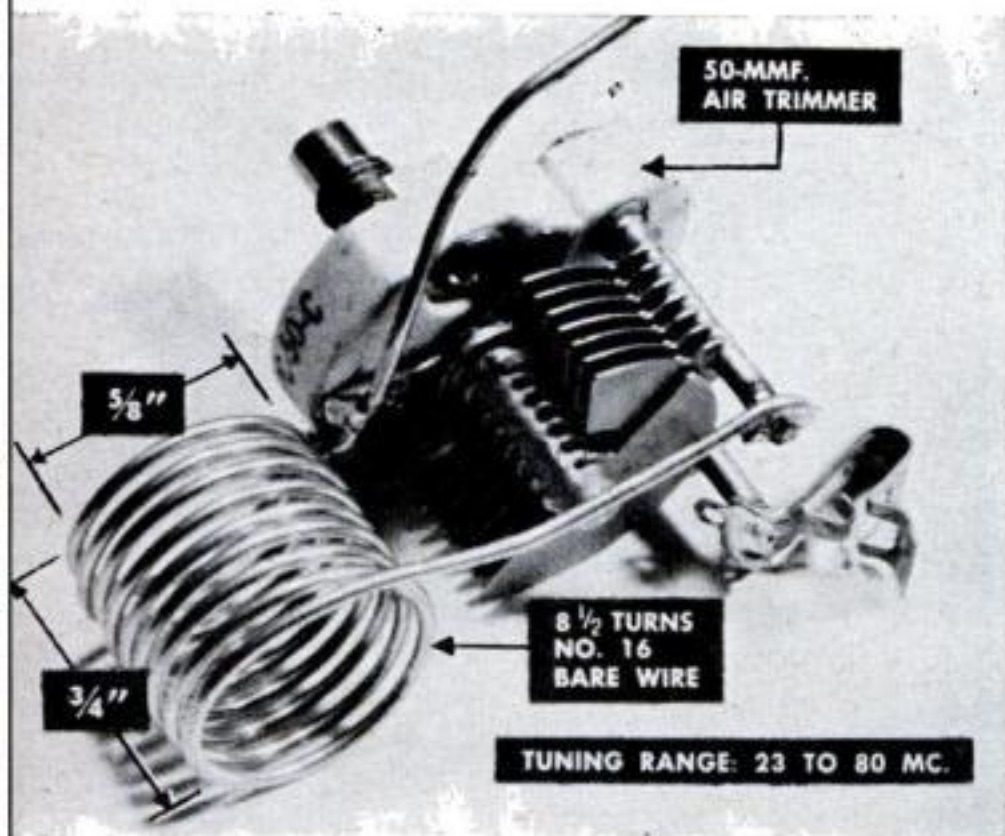
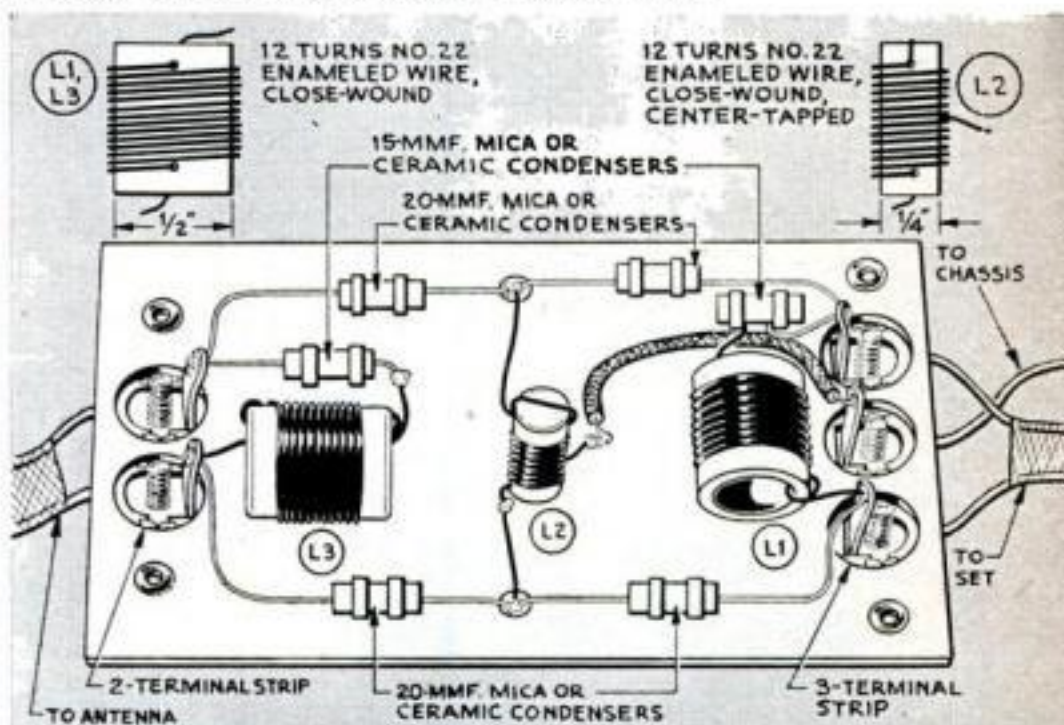
A STRONG signal is usually a good signal. If "hash" is getting into your picture, check your antenna and lead-in. Clean the antenna terminals. Make sure the lead-in is connected securely, and that both conductors are making good contact all the way down. Rotating the antenna may also help strengthen your signal.

The lead itself sometimes picks up "noise," especially from car-ignition systems. If you live near a busy highway, install the lead as far from the road as possible.

tween the lead-in and the set terminals and clip the ground lead to the receiver chassis. This filter isn't tunable—you just install it and leave it alone. If it weakens interference but doesn't quite kill it all, enclose the unit in a metal box and ground the box to the chassis.

END

Filters block out hit-and-run noise below the TV band. If interference source is close and strong, shield the unit in a metal box.



This trap tunes very sharply and is most effective against some types of strong, local noise.

One-Evening

Candlelight Warms Food.

This attractive food warmer harmonizes with most table settings. It will bring a flicker of candlelight to your table and at the same time keep a teapot or casserole at ready-to-serve temperature.

You can make one like it from strips of aluminum or stainless steel and some tin-can stock. All frame parts are made from $\frac{1}{16}$ " by $\frac{3}{4}$ " strips. Cut two 23" long and drill $\frac{1}{8}$ " rivet holes in the center of each strip and $\frac{3}{8}$ " from each end. Bend the strips as shown to form the crossarm center supports.

Where the strips meet at the bottom, bend one over the other so all four legs will rest squarely. Insert the center rivet top up and countersink the bottom hole so that the rivet will be flush when it is peened.

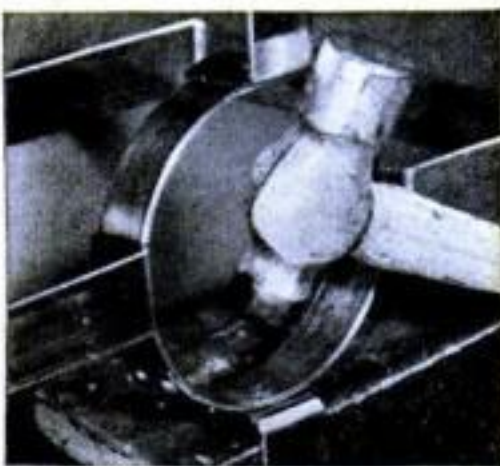
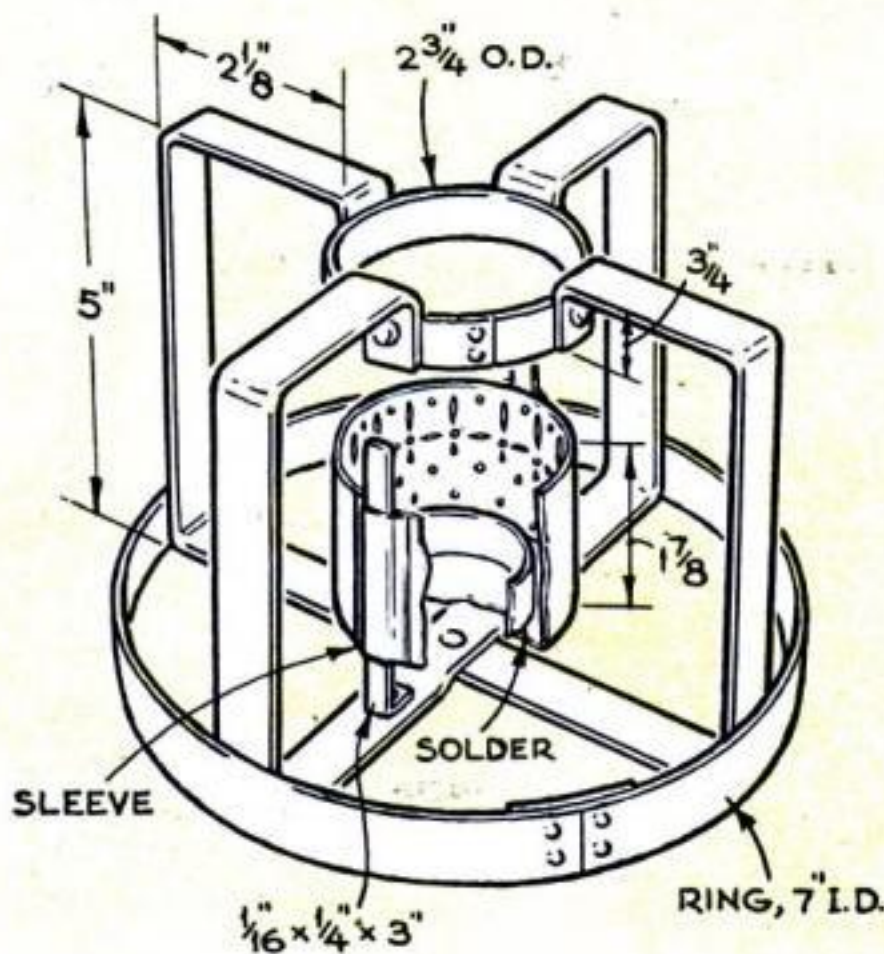
Make two rings of the same metal. One should fit between the turned-down portions of the uprights, the other around the base. Butt the ends of the rings and rivet them to short jumper strips as shown. Rivet the top ring in place and rivet or soft-solder the base ring.

For the candle cup, trim a can of the size used for condensed milk to a height of $1\frac{1}{8}$ ". Punch a pattern of holes all around to admit air to partly consumed candles. Solder a ring inside the cup bottom to hold a candle.

The food warmer in the picture was polished and lacquered. You may prefer to hammer, paint or heat-blacken the metal to suit your own decorative scheme.

The candle that goes best with this warmer is the squat kind that is supposed to burn for 15 hours. If you want more heat substitute an alcohol lamp or a tin of solidified alcohol.

Building time: two hours.



Dish holder is a ring riveted flush with upper ends of crossarms to form flat surface.

Candle cup is supported by two upright strips that enter tin-plate channels soldered to cup. Friction between strips and channels supports cup at any height.



Shop Projects

Give a Man a Horse He Can Ride. This steed will take your youngster where he wants to go lickety-split. If you start on it tonight, he can gallop in to breakfast in the morning.

The board from which the head is jigsawed should be finished on both sides and measure at least 1" thick after it is sanded smooth. For the stick use a broom handle or about 27" of $\frac{3}{4}$ " hardwood dowel. Cut a $\frac{7}{16}$ " by 3" slot for the wheel and drill the slot to take a $\frac{1}{4}$ " bolt that serves as an axle. Jigsaw or turn the wheel from $\frac{3}{8}$ " plywood.

Smooth all parts, taking special pains to round off sharp corners. Apply a primer coat of pigmented shellac.

Trace off the drawing detail and fill in the colors with bright, fast-drying enamel.

Building time: one hour.

Tray Serves Memories.

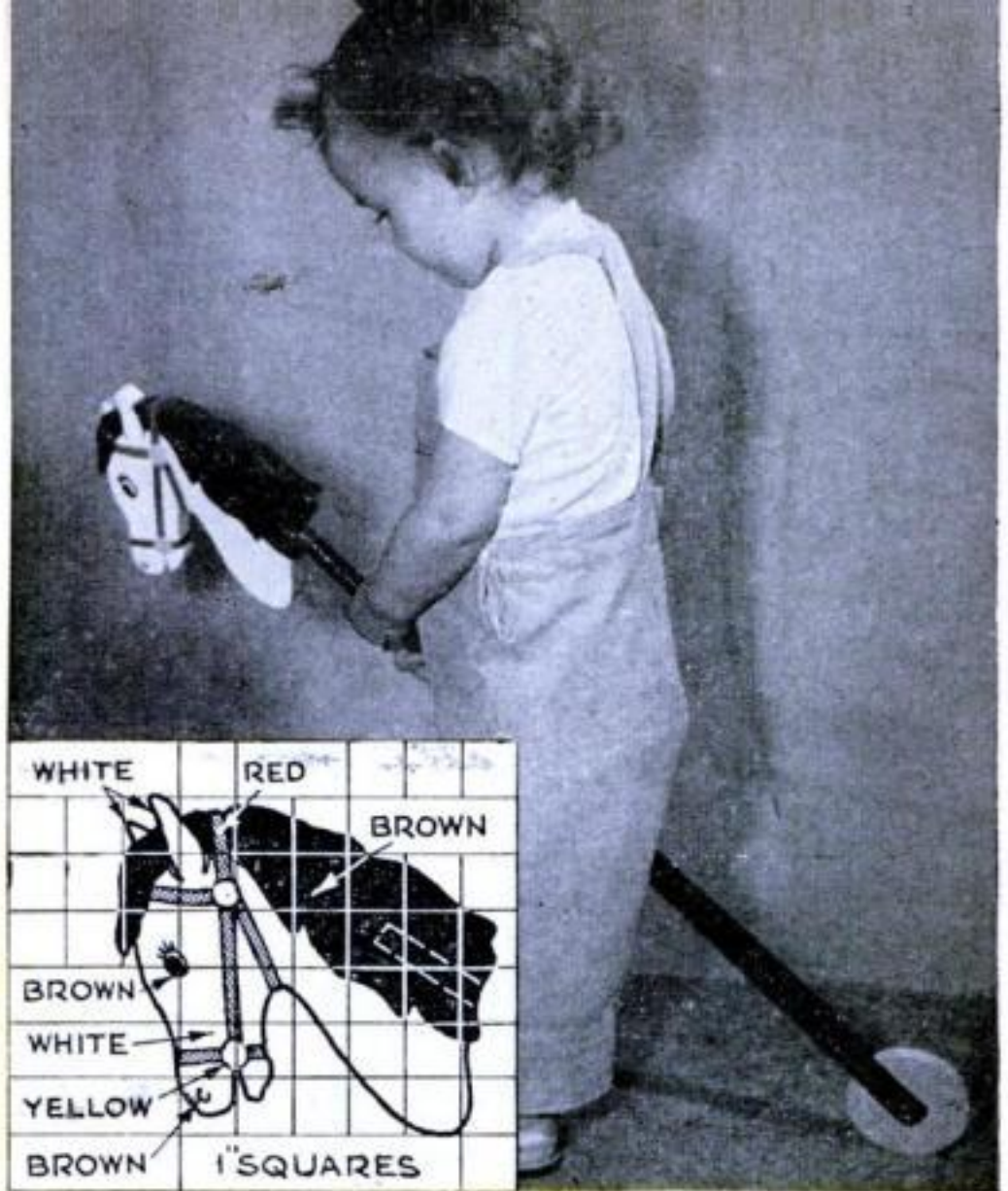
Intended to start summer sailors swapping yarns of the sea, this tray has a chart of local waters cemented to its surface.

The tray is made of African mahogany—a beautiful boat timber. The sides are $\frac{3}{4}$ " by $2\frac{1}{2}$ " strips measured to fit the chart, rabbeted at the bottom for a sheet of $\frac{1}{8}$ " composition board, and joined by dovetail joints. Clamp two scraps of the stock together and saw out cleat-shaped handles. Use them to outline the matching cut outs in the tray ends.

Assemble the parts with waterproof glue and add a few brads to secure the bottom. Sand all corners and edges round.

Stain and fill the wood and apply a thin coat of shellac to the frame. Finish the whole tray with three coats of clear varnish.

Building time: $1\frac{1}{2}$ hours.



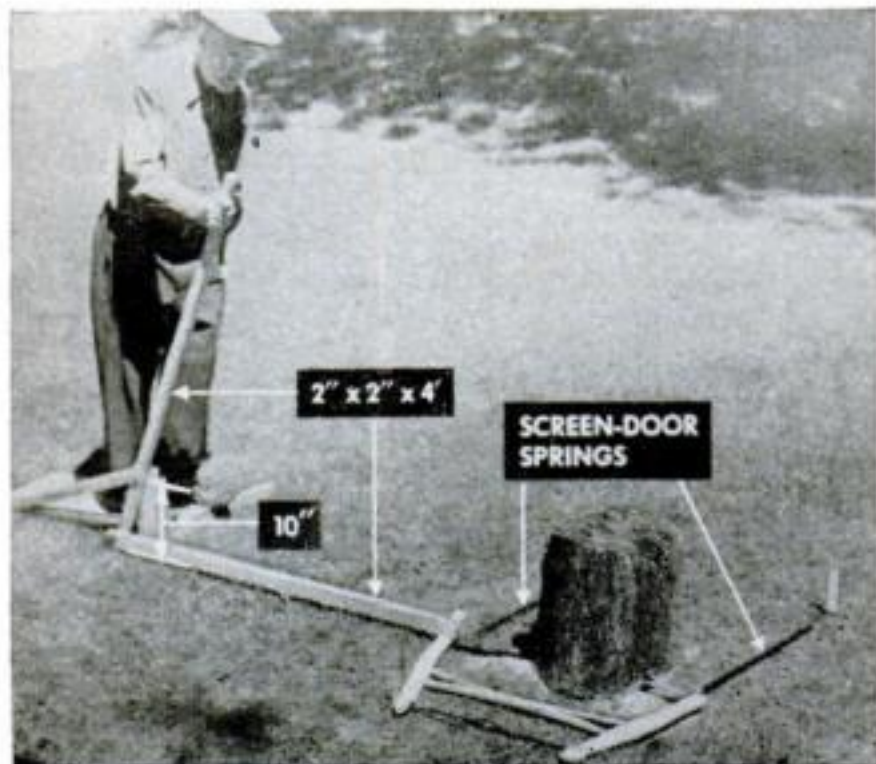
Dovetails are made square, then rounded off. Rabbets do not extend to ends.



Cleat handles have rough-hewn nautical look. They are cut by hand. The tray ends are cut to match and handles are glued in.

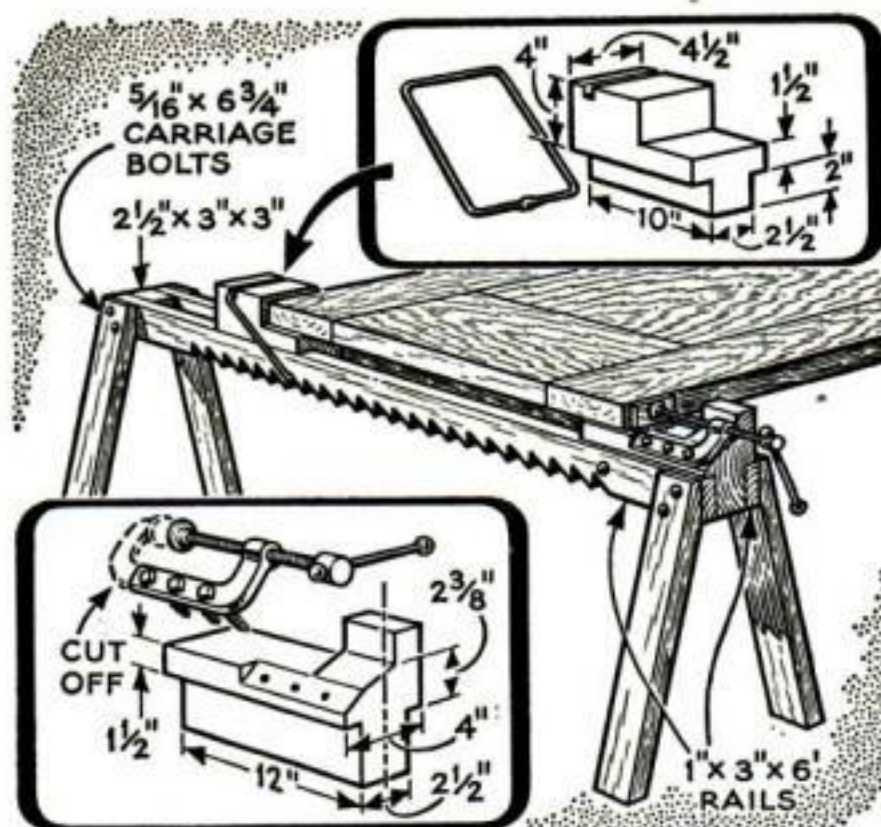
Lever Rig Saws Stump Flush

GETTING down on your knees to cut off a stump level with the ground is an open invitation to a stiff back. That's why I rigged this setup (below). Moving the lever works the bucksaw while the springs hold the blade against the stump. The spring stakes are reset to increase tension as the cut advances.—C.A. Veburg, Omaha, Neb.



Steel Wool Strains Fluids

A WAD of fine steel wool loosely packed into the neck of a bottle will strain out sediment in a liquid. I have used this dodge for straining cleaning fluids, developing solutions, roller-cleaning solvents, and thinners used to clean paintbrushes.—George Kapitan, The Bronx, N.Y.

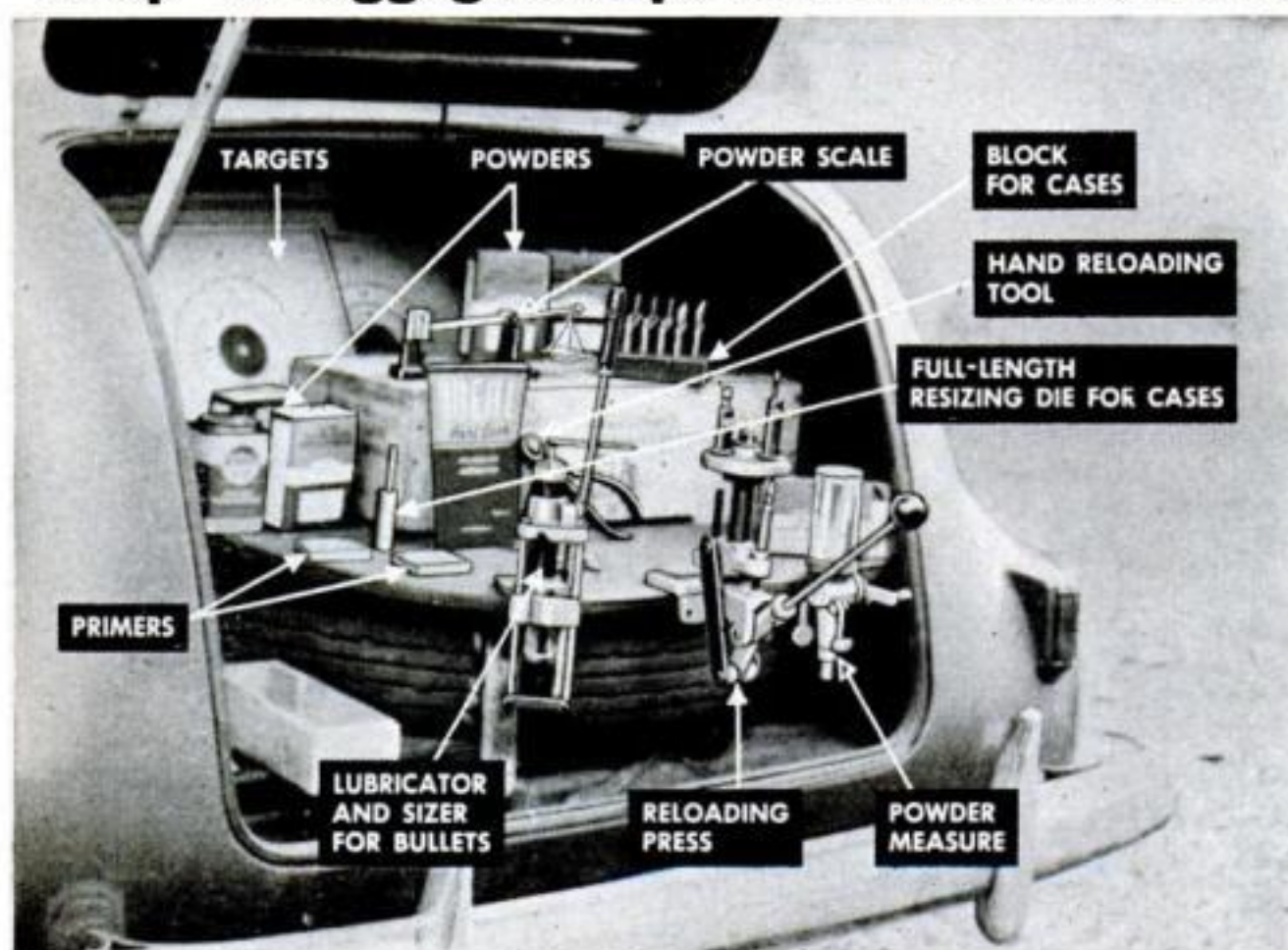


Gluing Clamp Is Like Sawhorse

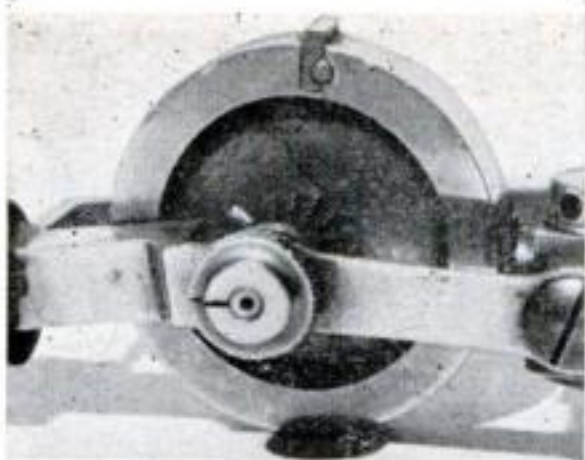
A PAIR of gluing clamps like the one above is invaluable in any shop that has frequent edge-gluing jobs such as doors or table tops. Since each clamp amounts to a sawhorse, the pair acts as an assembly table and saves on bench space.

Two notched rails are held apart at one end by a 2 1/2 inch spacer and at the other by an L-shaped block. The legs are bolted to rails and separators. A cut-off C clamp is lag-screwed to the block, and another hardwood block with a 2 1/2 inch foot to ride between the rails acts as the second vise jaw. A rectangle of heavy wire, its ends welded or brazed together, locks the movable block to the rails at any desired point.—R. E. Hancock, Portsmouth, Va.

"Shop" in Luggage Compartment Reloads Ammo in the Field



HERE is a handy setup for hunters and target shooters who reload their own ammunition. The tools needed are mounted on a piece of plywood that is bolted on top of the spare in the car's trunk. Complete equipment is provided so that a shooter can adjust the load to suit conditions on the firing range or in the woods. The reloading tools pictured are made by the Lyman Gun Sight Corp., of Middlefield, Conn.



Small gear linkage above was shot as at right. Aperture guide on rear camera determines correct lens stop. Extreme bellows extensions upset basic "f" relationships.



Tandem Cameras Shoot Pictures Bigger Than Life

HAILSTONES big as snowballs. Rosebuds the size of your fist. Miniature models several times their actual size.

That's how you can photograph small

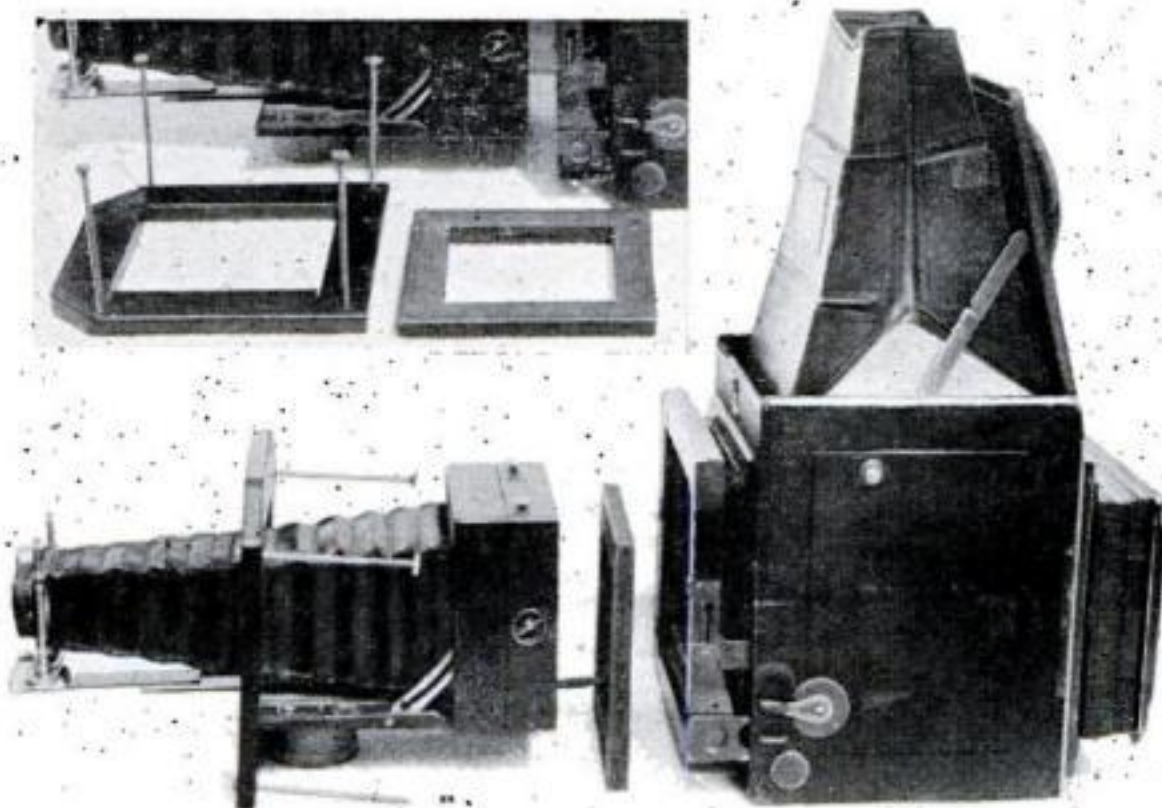
things with two bellows cameras. Mount one in front of the other. The extra bellows lets you move in close. Your subjects are magnified, and the images on negatives can be four or five times the size of the original.

The accompanying photos show how I do it. The rear camera is a 5" by 7" Graflex, the front one an old 3½" by 4¼" plate camera with triple-extension bellows and 5¼" lens. You can do the same with any two cameras of comparable size variation.

The rear camera must have a removable lens board and a front opening roughly equal to the rear of the other camera. If the lens-board opening is too small, it will cut off part of the image.

In my setup, a rectangular gasket cut from a kneeling pad forms a light-tight seal between the cameras. A wood flange smaller than the body of the front camera has bolts that are fastened through holes in the lens-board mount of the rear camera. Turning up the nuts clamps the cameras together.

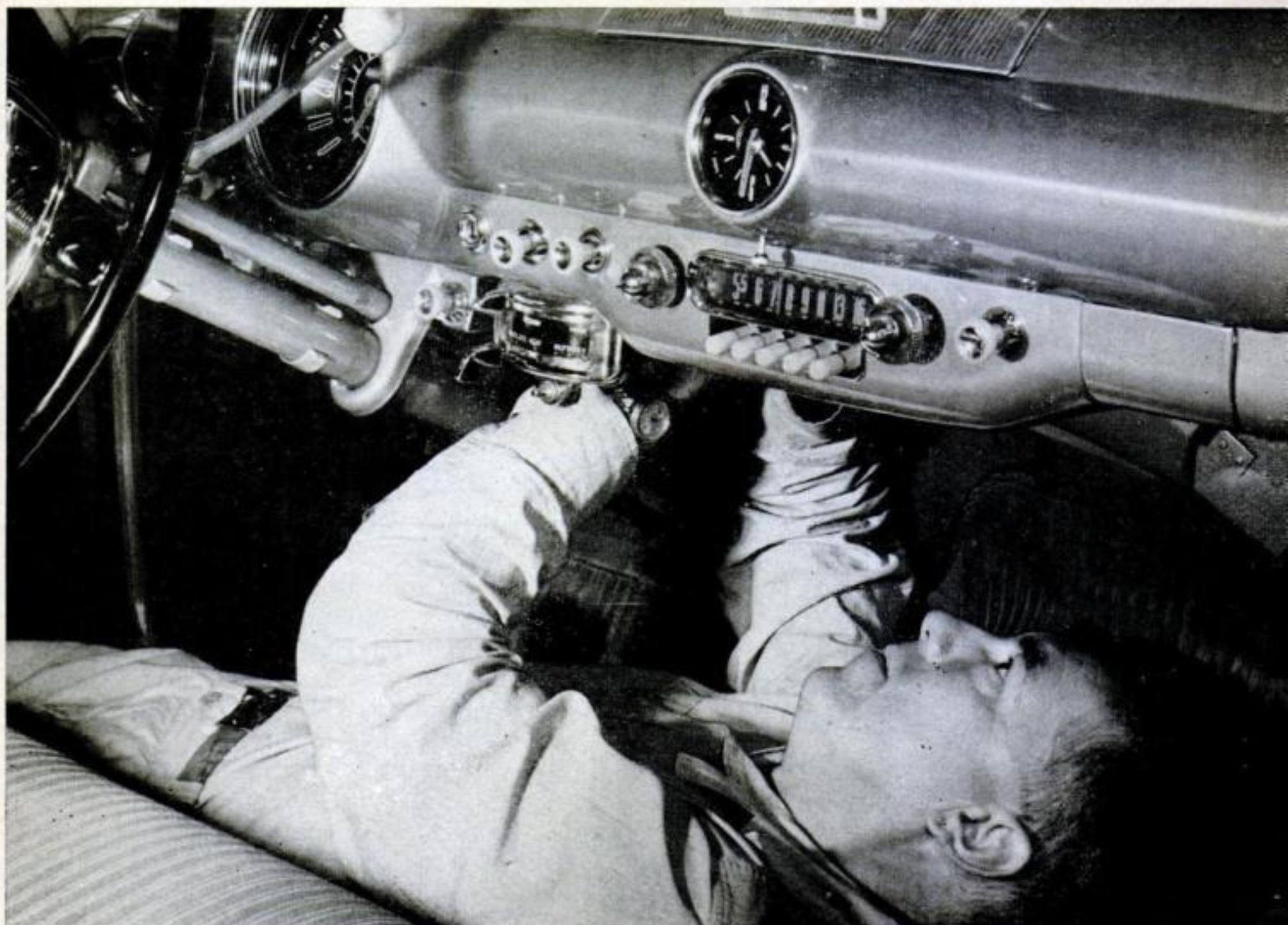
A stout tripod is required to keep the assembled cameras rigid.—Emery G. Gregory, Reedsburg, Wis.



Shelf Attached to Tripod Holds Projection Slides

IF YOU mount a slide projector on a tripod, this shelf cut from fairly stiff sheet metal will provide a convenient place to set the slides. Put a slotted tab at one end of the sheet and slip it over the tripod screw, fastening the projector on top.—Jim Miller, Moline, Ill.



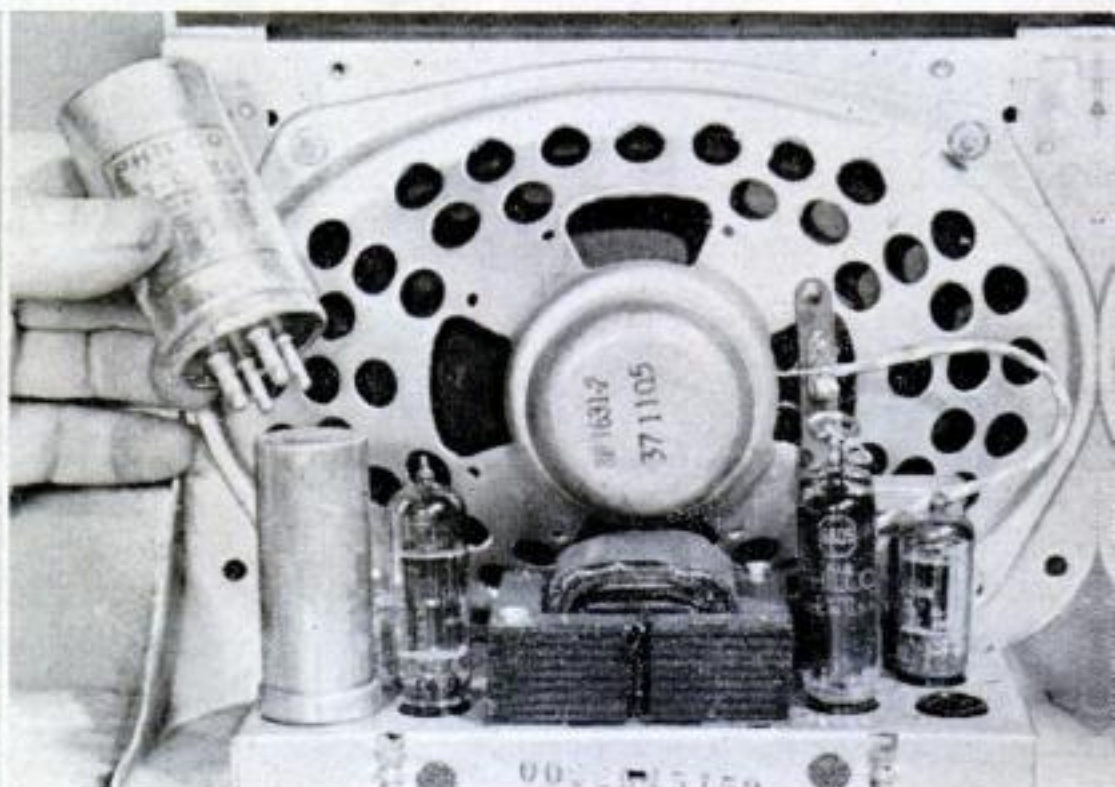
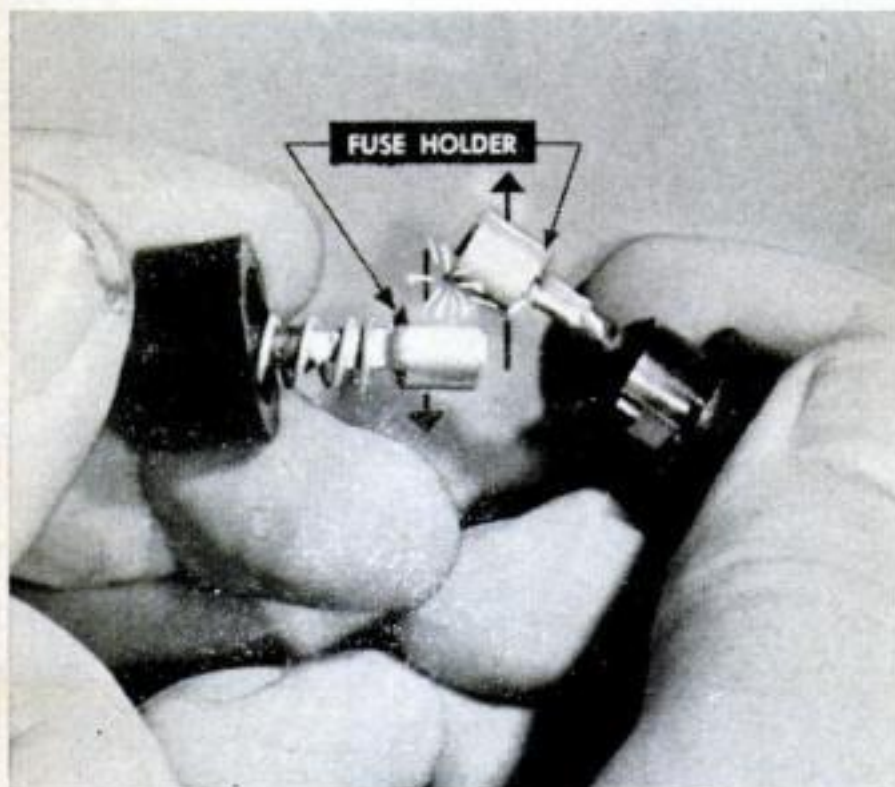


A crawl-under-the-dash repair job may be all that's needed after the trouble is diagnosed.

How to Service Your Auto Radio

"Flashing" the contacts of a fuse holder sometimes puts stuck-together vibrator points back in operation. Strike the metal clips together quickly, but *do not* hold them together.

The **vibrator**, a plug-in can, is the heart of the set's power supply. Listen for vibrator hum. Whether you hear it or not is an important clue to where to look for trouble.



When a set goes flooey, check these trouble spots before you call a specialist. Often you can start it perking with a simple, no-cost fix.

By Robert L. Rosekrans

A MODERN car radio is so well made that it's easy to forget that there's a lot of mechanism behind the panel. When a set acts up, you realize that all you know about it is how to play it.

But this still doesn't mean you have to buy a repair job when it quits playing. Even if you've never looked behind the dash, you often can find and fix the trouble yourself.

Testing in the car. If the set is completely dead, park the car in a quiet place and listen for a low, muffled hum. It comes—or should come—from the vibrator, an automatic switch that interrupts the six-volt DC from the battery and makes it act like AC.

The absence of vibrator hum means (1) the radio fuse is blown, (2) there's an open circuit in the "A" cable that feeds juice to the set, or (3) the vibrator itself is faulty.

Look for the fuse holder. It may be built into the case or it may be part of the "A" cable. Replace the fuse with one of the same ampere rating, as marked on the metal fuse ends.

Keep in mind that a blown fuse is usually a symptom rather than a cause of trouble. Defects in the vibrator or its associated circuits may cause the new fuse to blow as soon as you put it in. If this happens, it may indicate that the contact points in the vibrator have become lightly welded together. Pull back the insulated ends of the fuse holder, and strike the metal clips together. A surge of electricity sometimes frees stuck points.

If the vibrator still doesn't hum and the fuse doesn't burn out, inspect the "A" cable. Look for frayed or bent sections that might cover a break in the wire. And examine the lug-and-nut connection at the ignition switch or ammeter. Make sure it is tight and clean.

If the set is dead but the vibrator hums, check the antenna. The lead from the outside whip is usually connected to a socket on the receiver

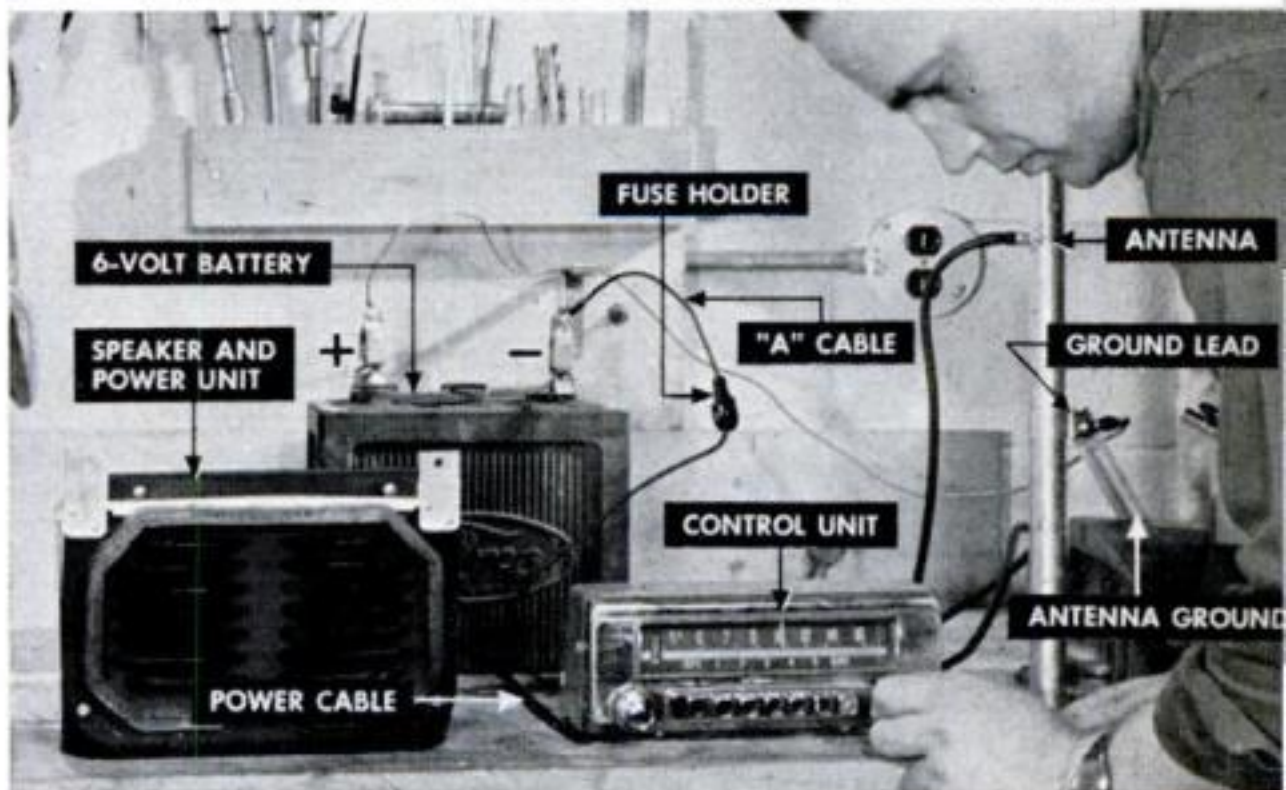
chassis. The socket may be marked, but even if it isn't, you can easily locate it by tracing the cable that comes from the whip antenna. Unplug this lead. Bare the tip of a length of insulated wire and insert it in the antenna socket. Make sure the bare wire does not touch the case or any car metal. Hold the other end of the wire in your hand. If the set starts to play, the antenna is faulty. The whip or the lead-in may be open or shorted to the car body. Check the lead, and, if necessary, replace first the wire, then the antenna itself.

Auto sets sometimes come complete in one package, like little home radios. More often they are built in two or even three units. It is common to find the speaker, vibrator and power supply in one metal box. The rest of the set may be in one unit or the tuning controls may be separate. If your set consists of more than one unit, see that all the connecting wires and cables are intact. Sometimes they get in the way and are yanked loose when you open a ventilator or pull on the hand brake.

Testing on a bench. If these in-car checks do not reveal the trouble, you'll have to take out the set for bench tests. Most sets are designed for easy removal. Bring the fuse in, along with each set unit if they are separately cased.

Borrow the storage battery, too, or if you

Bench tests may be needed to track down some troubles in a car radio. The set may be built in one, two or three units. All must be removed and properly connected to a battery, antenna and each other. Look for unlighted or cold tubes.



have a garage workbench, rig up leads from the battery. Note the terminal connections; in some cars the positive pole is grounded and in others it's the negative. When you bench-test the receiver, connect the "hot" side to the radio "A" cable and the ground side to the metal case of each of the receiver units.

Listen again for vibrator hum. If there is none, wiggle the vibrator in its socket or lift it out and reseal the prongs firmly. If it refuses to buzz you can replace it with another of the same type and part number but you may be gambling the price of the unit. A defective vibrator, like a burned-out fuse, is more often a symptom than a cause of trouble, so the new one may burn out very quickly. To play safe, let a serviceman check the set after you have spotted vibrator trouble.

If the vibrator hums but the set doesn't play, the next thing to look for is burned-out tubes. Replace any tube that doesn't light or warm up.

Interference and Static. Auto radios are subject to a lot of static from inside and outside the car. The worst kinds can be eliminated but you may have to learn to live with some of the minor ones. Static produced by the car's electrical system is easy to track down. Tune the set to bring maximum interference; then turn off the engine. If the noise dies with the engine it probably originates in the generator or in the ignition.

Generator noise is a fairly regular hum.

Ignition noise has a sharp, crackling quality. Both start at fairly low frequency and increase noticeably in pitch as the engine is speeded up.

If you suspect the generator, check the connections to the generator condenser. One terminal is usually the metal saddle that holds it to the generator, the other is an insulated wire. Both terminals should make firm contact.

If cleaning and tightening the terminal contacts doesn't eliminate the noise, replace the condenser. Persistent generator noise that can't be suppressed by the condenser may mean the generator commutator needs turning down.

Ignition noise is often caused by a loose or poorly connected high-tension wire. It may be at the distributor, spark coil or plugs.

Some of the noise generated under the hood works its way through the radio's power supply, some is picked up by the antenna or lead-in. Tune in as much noise as you can and disconnect the antenna plug at the receiver. If the noise disappears with the signal, examine the lead-in. Make sure that its shield is grounded.

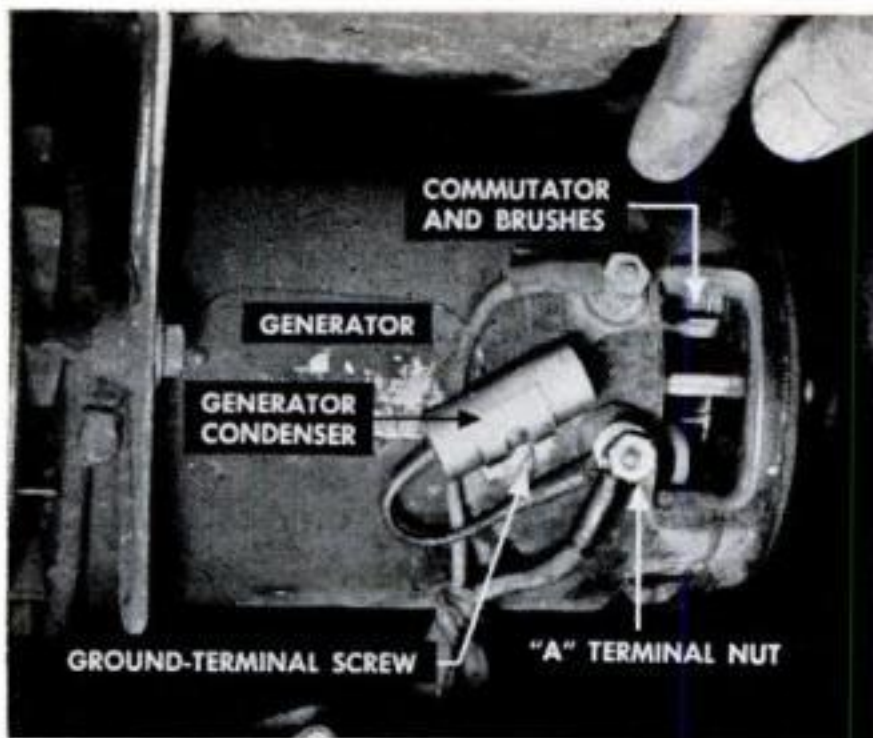
Static electricity generated by the movement of the car is often heard as erratic, irregular popping. It rarely shows up on rainy days.

Dry-weather static usually can be traced to the curb feelers or tires. Bend the feelers up a little further from the ground and inject

AUTO-RADIO INTERFERENCE

If the noise you hear is:	Look for:	Then do this:
Low hum that rises in pitch as engine speed increases	Generator interference	Shut off engine. Noise should stop. Check connections on generator condenser. Replace condenser.
Sharp crackling that rises in pitch as engine speed increases	Loose high-tension wire at distributor, coil or spark plugs	Tighten connections.
Intermittent popping that does not appear on rainy days	Static electricity—generated by curb feelers or tires	Bend up curb feelers. Inject static-suppressing powder into tires, including spare.
Crackle like ignition static, but does not disappear when you shut off engine	External interference from streetcars, power lines, etc.	Retune set.
Hiss that accompanies programs from weak or distant stations	Background interference	Retune set.

FOR YOUR POPULAR SCIENCE INFORMATION FILE



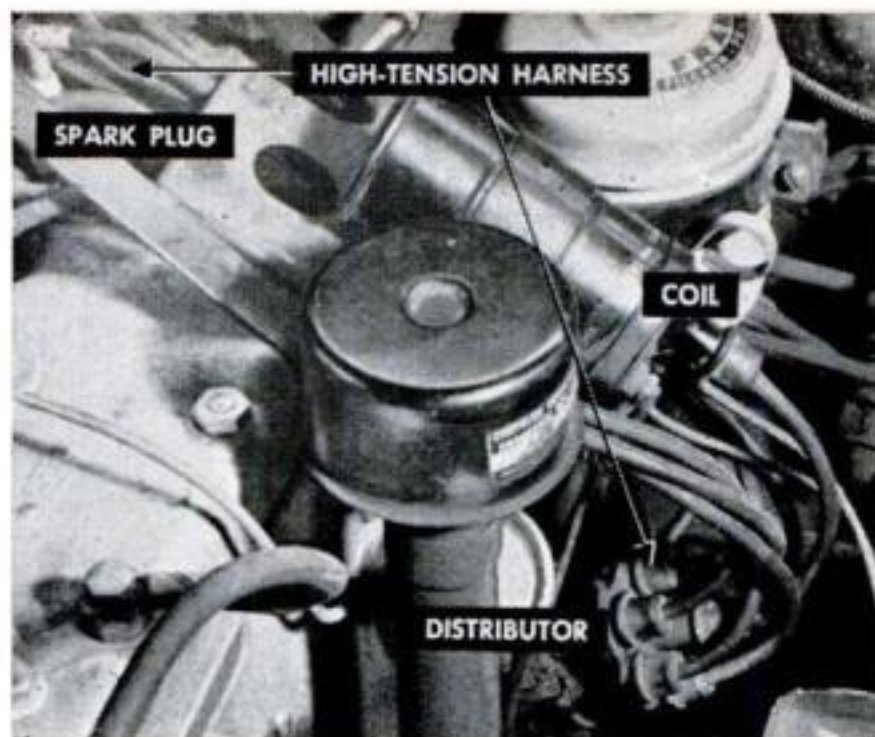
A faulty generator or condenser may produce car-radio noise. Clean and tighten the condenser contacts. If this doesn't help, replace the condenser with an exact duplicate.

anti-static powder into the tires. Don't forget the spare.

Background noise varies with station distance and atmospheric conditions. To test it, stop the car and fish the dial for a stronger or closer station. If the noise disappears, you might as well write it down to a weak signal and forget it.

External interference is most common in cities. You notice it when you drive near streetcars, electric signs, busses and some factories.

There's not much you can do about background or external noises, but being able to recognize them will make it easier to track



Ignition noise usually comes from the high-voltage electrical system. Check all connections at the coil, distributor and spark plugs, and tighten any that seem to be loose.

down other troubles that you can do something about.

Mushy sound—you get stations but they sound terrible—can be caused by trouble within the receiver, but most often it comes from a bad speaker. (Vibration, temperature changes and running the set at a high volume level are all apt to damage voice-coil alignment and the cone itself.) For a comparison check, try to borrow a good speaker of the same kind. Also examine the cone for tears. Speakers usually can't be repaired satisfactorily; a replacement is best. **END**

Next Month: Ways you can use sound-powered phones in your home, shop and garage.

AUTO-RADIO REPAIR

If complaint is:	Look for:	Then do this:
IN-CAR CHECKS		
Set is completely dead (no vibrator hum)	Blown fuse	Replace fuse.
	Open "A" circuit	Examine cable for break or loose connection.
	Defective vibrator	"Flash" fuse contacts.
Vibrator hums but set doesn't play	Short or open circuit in antenna	Substitute length of wire for antenna; check antenna lead.
BENCH CHECKS		
Set is completely dead (no vibrator hum)	Defective vibrator	Wiggle vibrator in socket.
		Replace vibrator or have set checked by serviceman.
Vibrator hums but set doesn't play	Burned-out tubes	If no tubes light, check interconnecting cables between receiver units.
		If some tubes light, examine all for filament glow or feel for warmth. Replace unlighted or cold tubes.

FOR YOUR POPULAR SCIENCE INFORMATION FILE

Have You Tried Using a Fruit-Juice Can?

DON'T throw out frozen-fruit-juice cans. They're a handy size for craftwork projects and have many shop uses. They're just right for mixing or heating small batches of glue. Use them for molds to form fat, short candles from remelted candle ends. Cut them in half, lengthwise, add rubber-headed tacks for feet, and they make cigarette servers. Open a can at both ends, rest it on its side in a wire cradle, and it's a safe soldering-iron stand. Several other uses are illustrated. You can work out many more.



A tank truck made from a can and a few odd scraps of wood.



Tube shield is can with three lugs soldered on at open end.



Simple candleholder shields the candle's flame from drafts.



Scoop is made by snipping out tin and adding handle.

Biscuits or cookies are cut out in a hurry with a juice can.

A heart-shaped cutter is easily bent to shape with pliers.

Back to sand they go. To see the basic difference between silicones and their organic counterparts, burn a bit of silicone rubber (silicone stopcock grease will do) and a bit of ordinary rubber, catching smoke from each on a sheet of cold glass. From ordinary rubber (far right) you'll get the familiar black soot of carbon, from the other a white vapor of silicon oxide—finely divided white sand.



SILICONES in Your Home

These strange substances have come from the laboratory to win themselves a special place in the everyday world.

By Kenneth M. Swezey

UNTIL a couple of years ago, silicones were known chiefly by reputation. But today you meet these amazing sand-derived compounds in dozens of useful products.

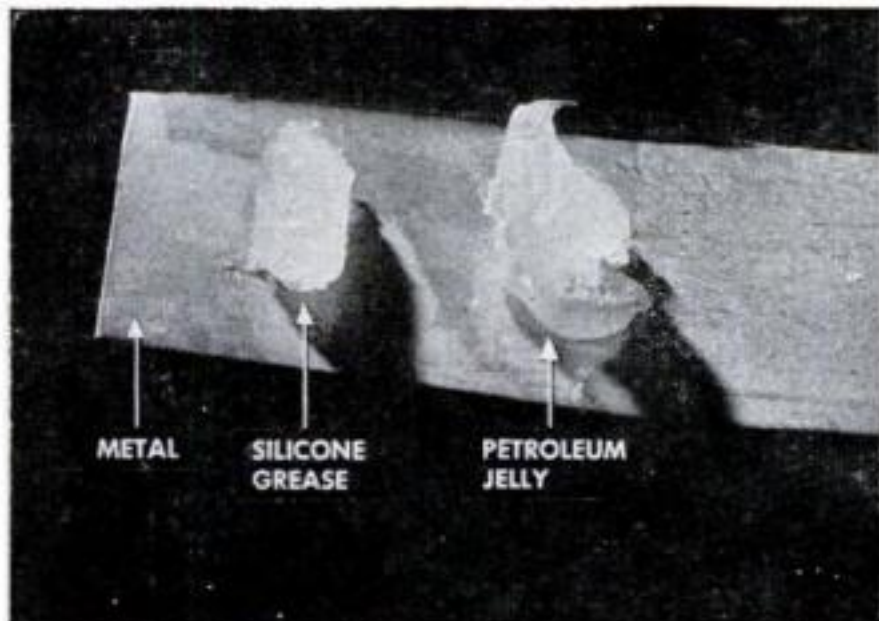
You can polish your furniture or wax your car with them, make fishing flies float better, lick electrical leakage on outdoor insulators, and treat cooking pots and pans so food won't stick—to name just a few of the many ways in which they are being used today.

The ability to repel water is one outstanding trait of silicones. Another is the

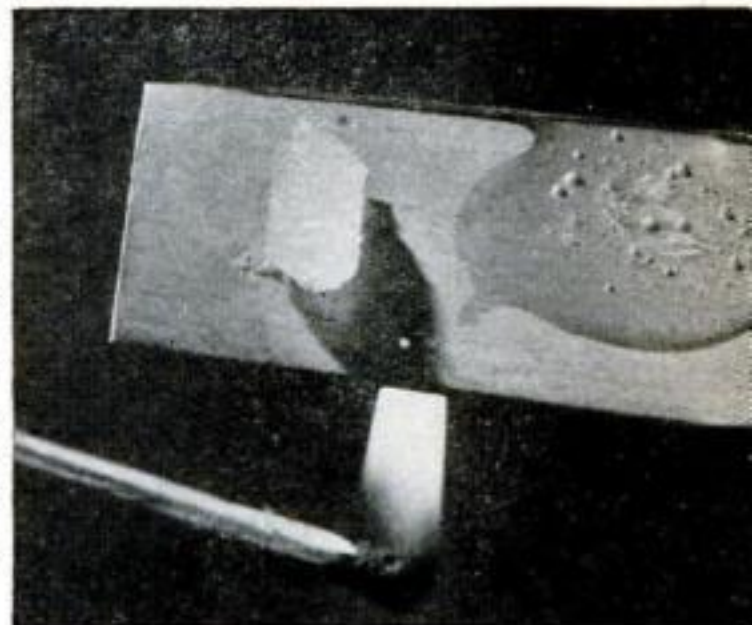
ability to withstand extreme heat or cold that would break down or freeze comparable organic materials. This property results from their backbone of sand, or silica, the word from which their name comes.

Outwardly, the silicones look for all the world like familiar oils, greases, resins and rubber compounds. But the accompanying experiments will show you remarkable differences.

To perform them you need such silicone materials as Dri-Glo furniture polish, Pantastic utensil coating, Dow-Corning stopcock grease and bouncing putty. You can get the grease from chemical supply houses, the putty from novelty shops, and the polish, wax and pan coating from many department stores.

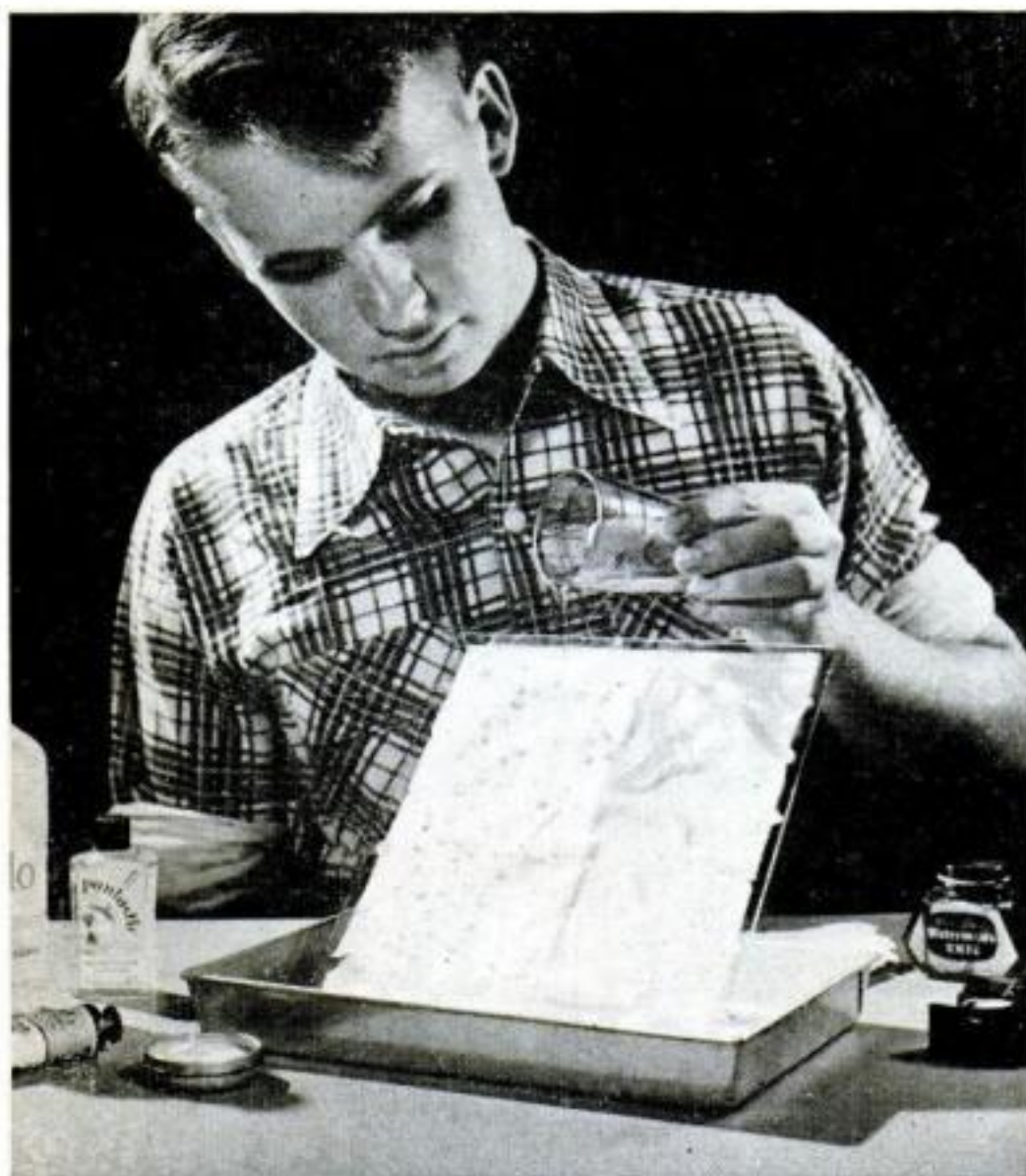


Heat or cold will not affect silicone oils and greases. Their backbone of heat-stable silicon oxide makes them useful under conditions where ordinary oils and greases would freeze, leak out or burn. Silicone stopcock grease, for example, won't harden at minus 40° and won't melt at 400° F. As test at right shows, a match readily melts ordinary greasing jelly.

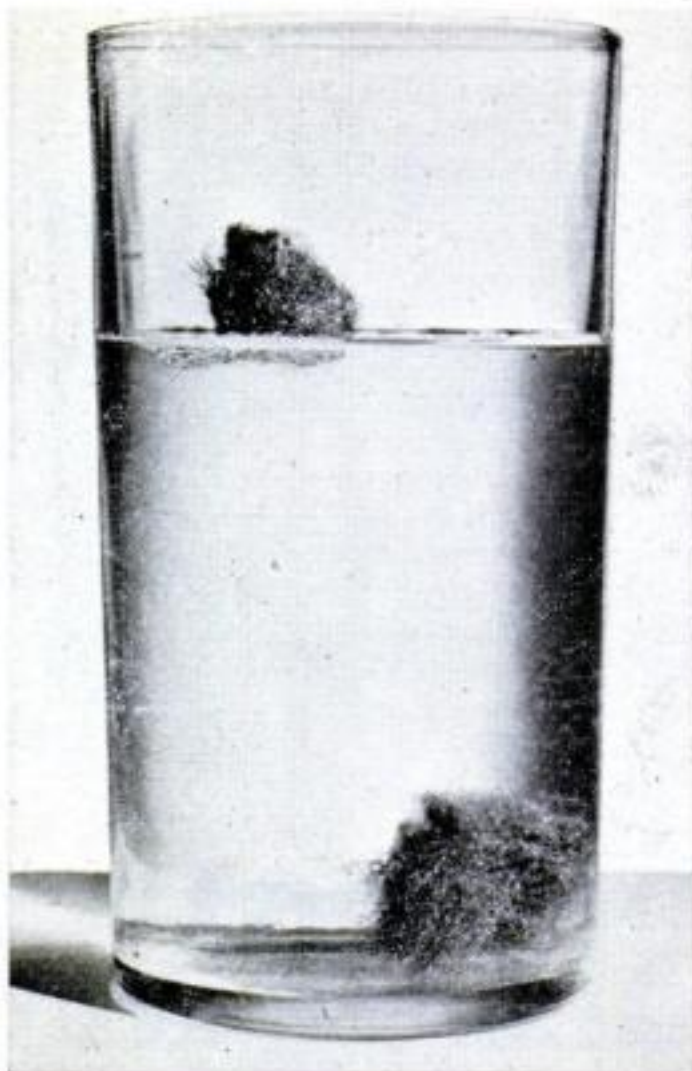


To see what silicones can do, please turn the page.

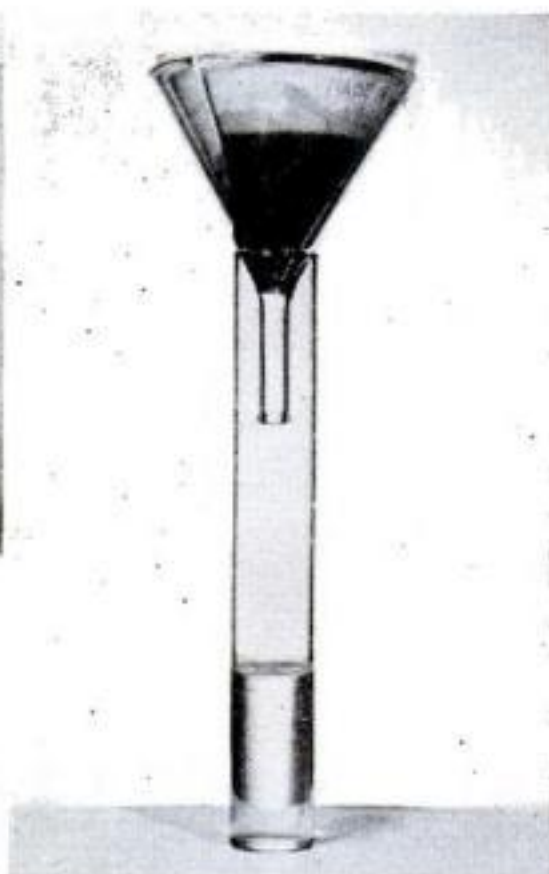
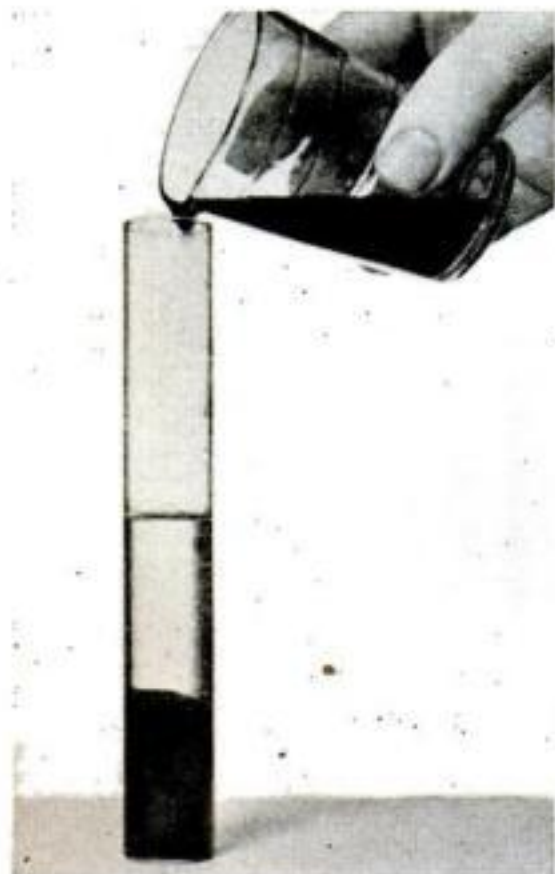
NOVEMBER 1951 221



Silicones repel water. You can prove this for yourself. Apply silicone furniture polish to a cloth, and rub the cloth over half a paper-towel resting on a sheet of glass. Then pour water over the towel as above. The water will roll off the silicone surface but will wet the other half completely. This quality adds to effectiveness of car and furniture polishes and is also used to make clothing showerproof.

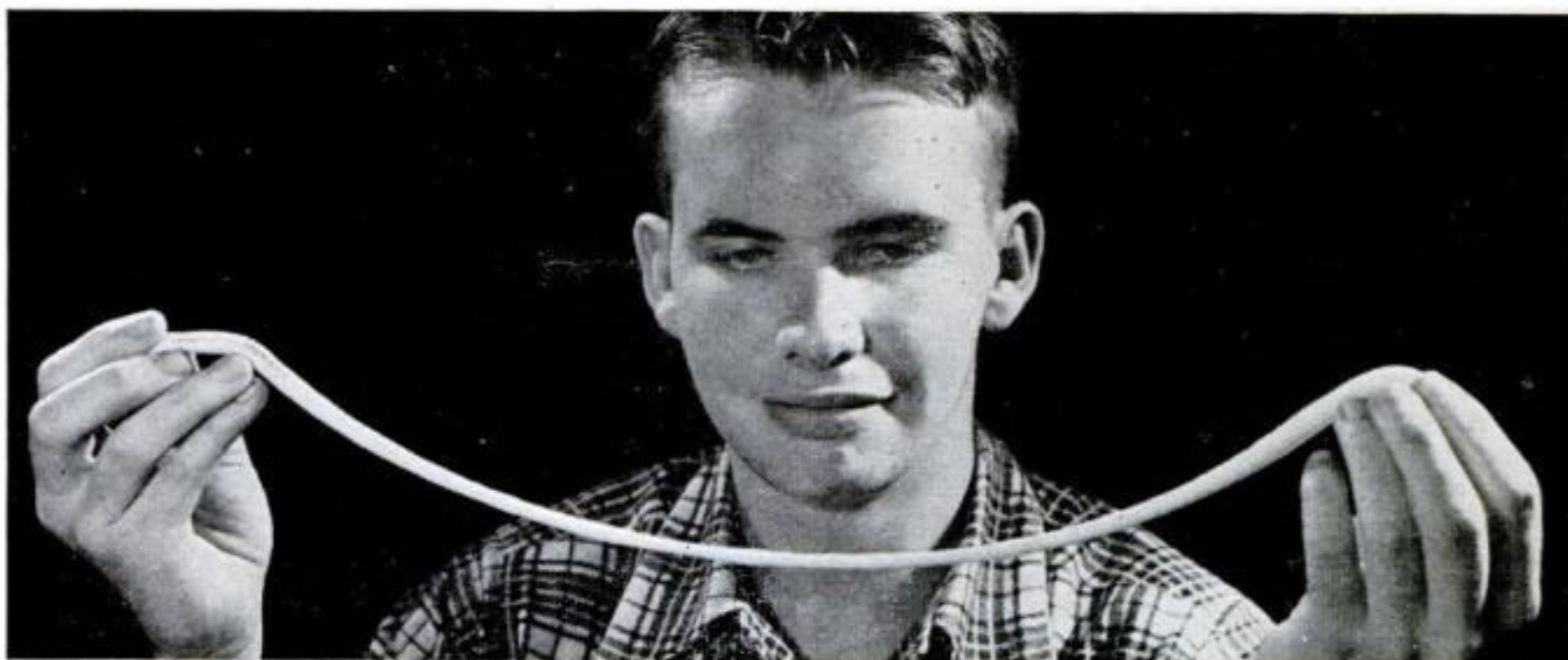


They make metal float. How fishing flies stay up when treated with silicone oil can be shown with this steel-wool stunt. Saturate a small wad of clean steel wool with Pantastic and squeeze out the excess. When dry, dunk this and an untreated wad in water. Treated wad will float, the other will go to the bottom. See page 224 for other uses of Pantastic.

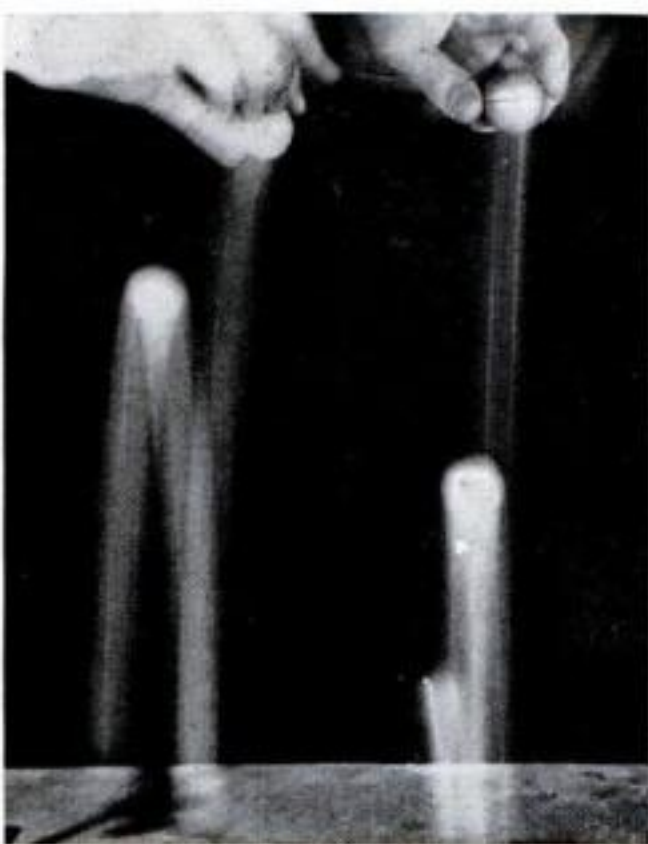


How they affect clothing. A coat treated with silicone water-repellent sheds water but lets air and water vapor through the cloth. That's why it is more comfortable than a waterproof coat, made of plastic or rubber, that traps perspiration by preventing air circulation. To see how a material can shed water and still be porous to other liquids, cut a disk from a paper towel,

give each side two coats of Dri-Glo polish, fold into quarters and put into a funnel. Pour equal parts of benzine and ink-colored water into a bottle (left). Shake thoroughly (center) and pour mixture through paper-towel filter into another bottle. Clear benzine will trickle through, but colored water will be left behind in filter (right).



Bouncing putty is one of strangest silicones. Pull a wad slowly and it will stretch like taffy.



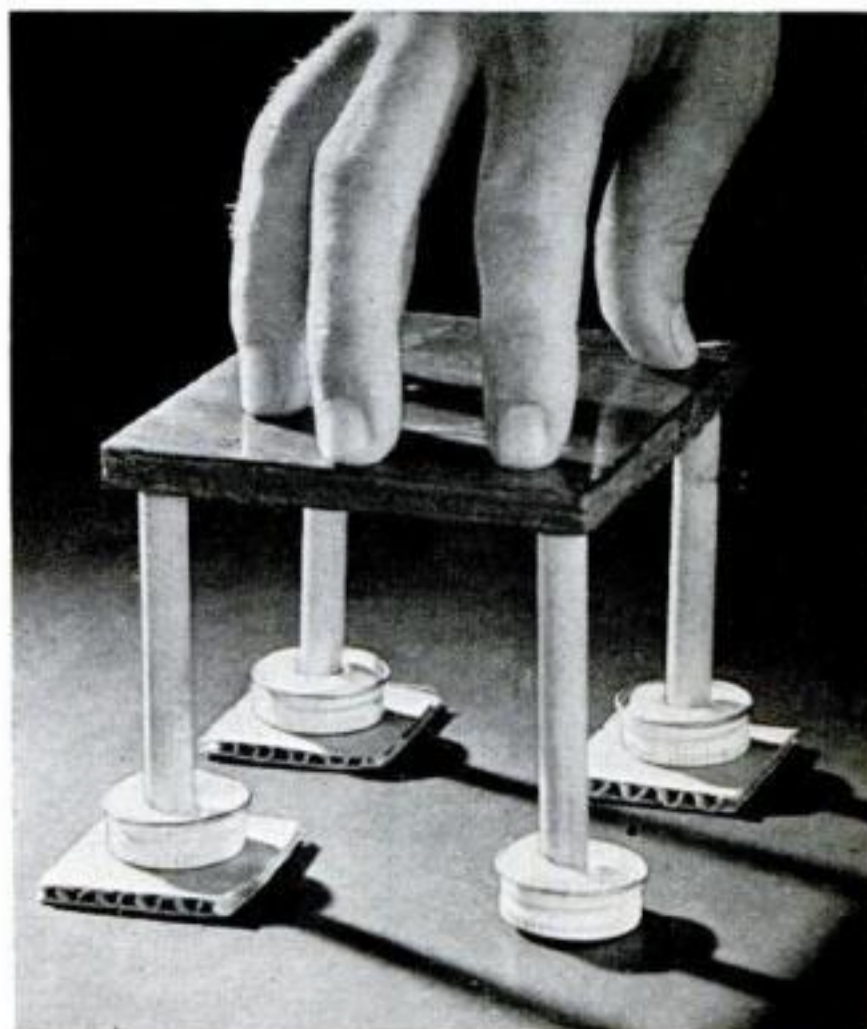
Mold putty into ball and drop it and ordinary rubber ball from same height. As these patterns show, the putty (far left) will bounce higher and faster than the rubber ball.

But smack putty with a hammer while it is on hard surface (right) and it shatters like glass.



How bouncing putty is used. You'll find it in devices made to stop furniture from wobbling on uneven floors (see page 142). You can show how these work by setting the legs of a toy table in bottle tops containing bits of bouncing putty. With cardboard, raise three legs higher than the fourth. Then press down on table top to try to wobble it. Steady pressure on a corner tilts table but it won't wobble. The putty acts as a slow-motion hydraulic fluid, flowing out from under one leg and rising under opposite one as the pressure is changed. Bouncing putty also makes core of some golf balls.

Bouncing putty's secret. This freak silicone actually is a slow-moving liquid. Put a ball of it on a shelf and the ball eventually will flatten. Pulled slowly, the material flows with your pull. But if you pull it quickly, throw it on the floor or hit it with a hammer, it snaps, rebounds or shatters, for its molecules have a speed limit beyond which they can't flow past each other.



Please turn the page for more on silicones.

NOVEMBER 1951 223



Foam prevention is important use of certain silicone fluids. Excessive foaming may mean an inferior product or waste in making rubber latex, in preparing wines and jams, in circulating oils and in other industrial operations. Certain silicones will stop the foaming. You can see this by adding a drop of Dri-Glo to a bottle containing soapy water topped by suds (left). Shake bottle and foam will vanish (right). It cannot be formed again.



How You Can Put Silicones to Work

Pan-coating compound has other uses, too. Just wipe it on with a cloth. It dries quickly, will not affect taste of food.



Keep food from sticking. After compound has been applied to metal or glass pots and pans, a soak, a wipe or a rinse will clear away remaining food. Application may last for as many as 60 uses if pot is not scoured.



Prevent electrical leakage. Spread on insulators used with outdoor antennas for radio or television sets, silicone compound will cause water to break up into separate globules, thus preventing electrical loss.



Keep ice trays loose. Trays won't freeze to freezing compartment, and cubes will break away from tray with little trouble.



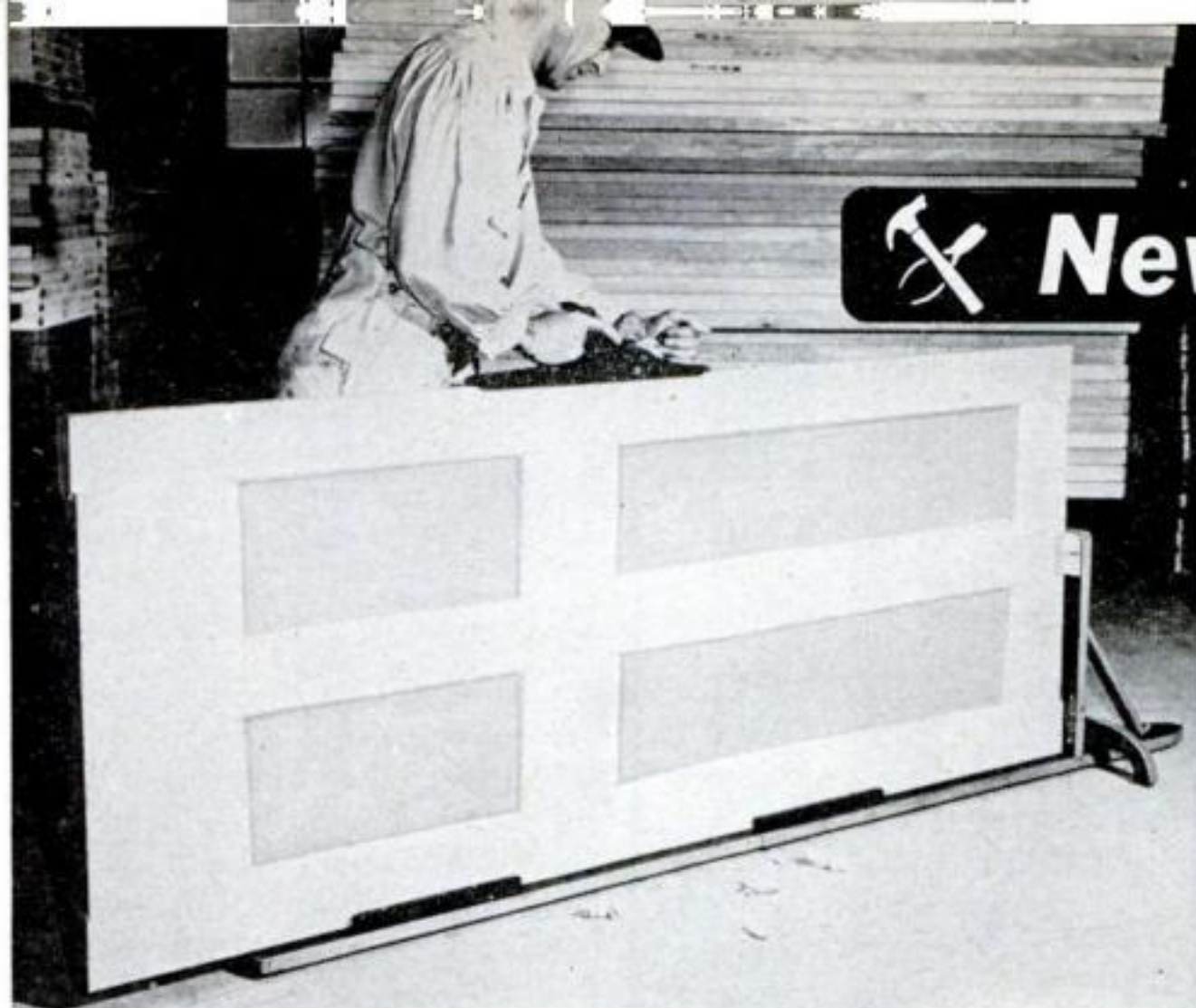
Iron more easily. If the compound is applied to the bottom of your iron, the iron won't stick to starched fabrics.



Bake without grease. You can usually forget about the grease for baking tins and waffle grids. However, grease still is needed in baking anything that has much free sugar.



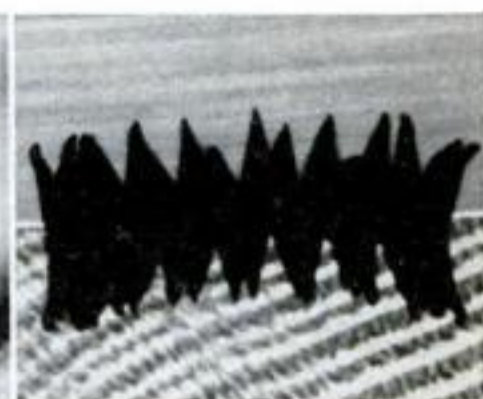
Clean a stove easier. Food drippings can be cleaned from range burners and oven broilers as easily as from china or glass after being protected with silicone compound.



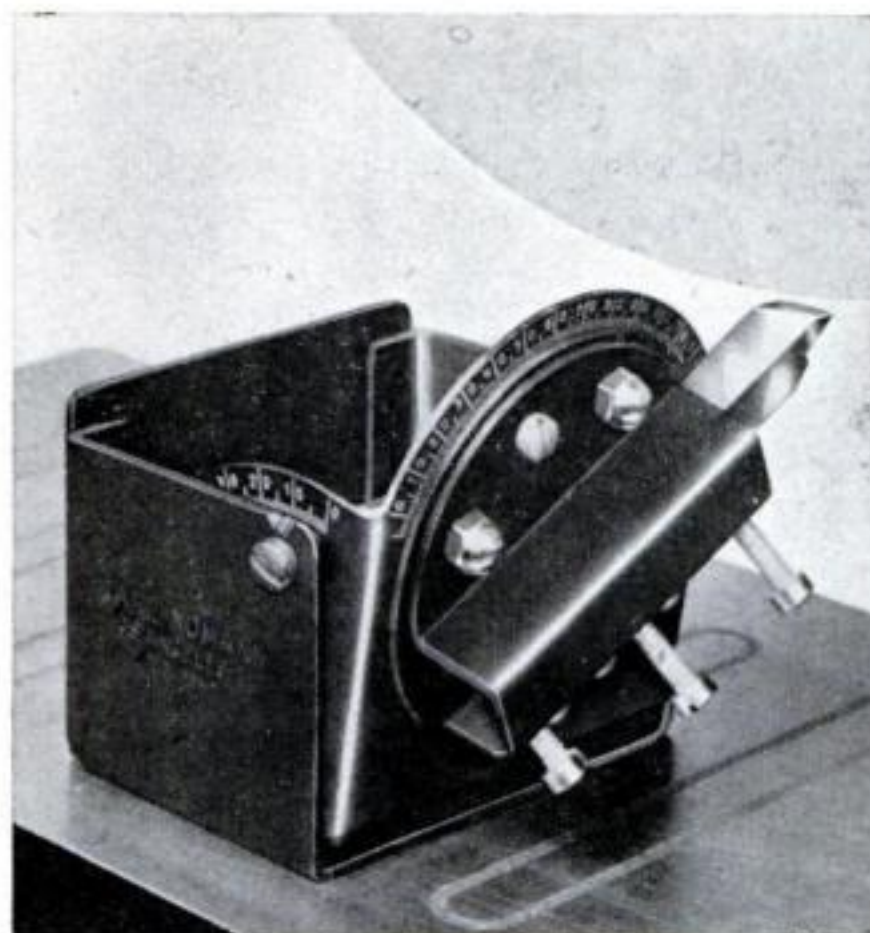
New Tools

Door Jack Folds. Although this tool for supporting doors measures 7½' in length when fully extended, it can be folded to about half that for carrying. Pulling a pin disconnects the jack at the center. The upright measures 18". *E-Z Mark Tool Co., Los Angeles.*

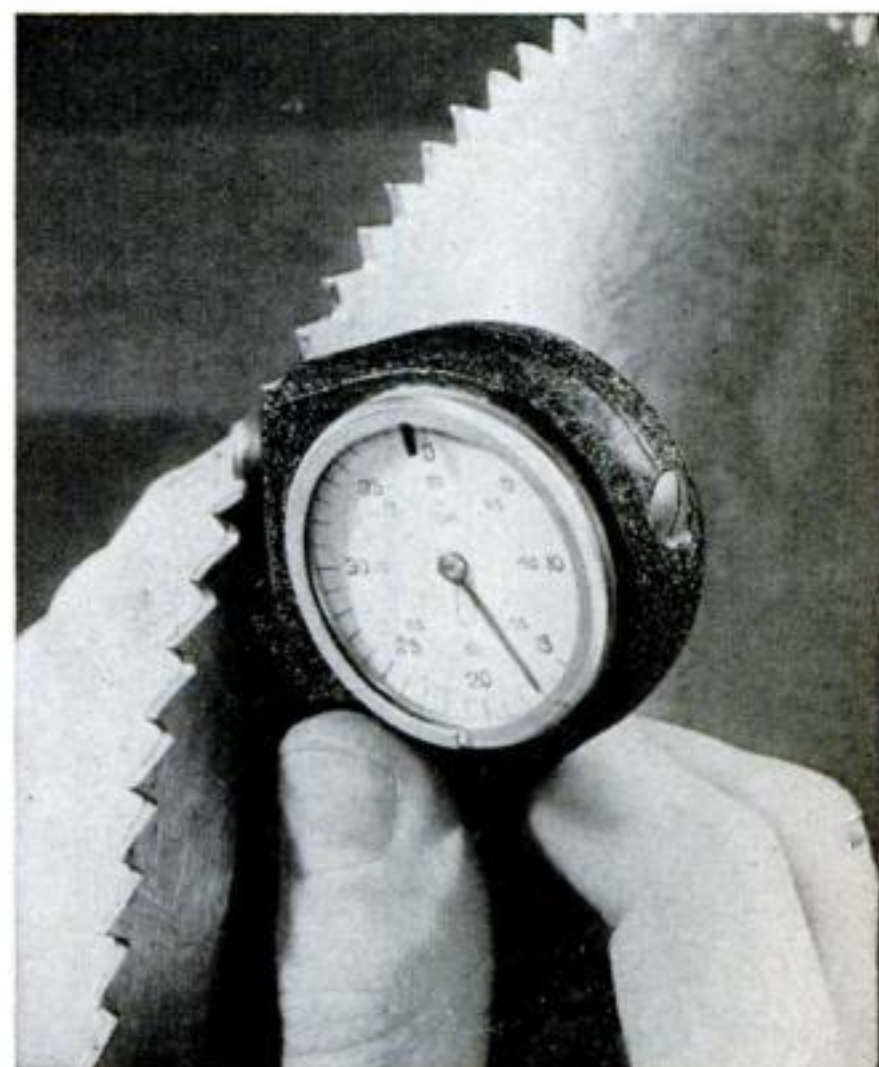
Fastener Joins Wood. Even if one part is hardwood and the other softwood, this toothed band joins them securely. Photo at right shows how fastener looks to the naked eye; at far right is an X-ray view of it embedded in two pieces of wood. It is made in three sizes. *Metal Industries, Inc., Burr-Lock Division, Youngstown, Ohio*



Grinds Tool Angles. Tool bits up to ½" in section can be accurately ground to any angle with this holder. Three setscrews hold the tool in place in a slot while the dials show the angle it is set at in two planes. It can be used with a magnetic table. *Carl Nomann Co., Los Angeles.*

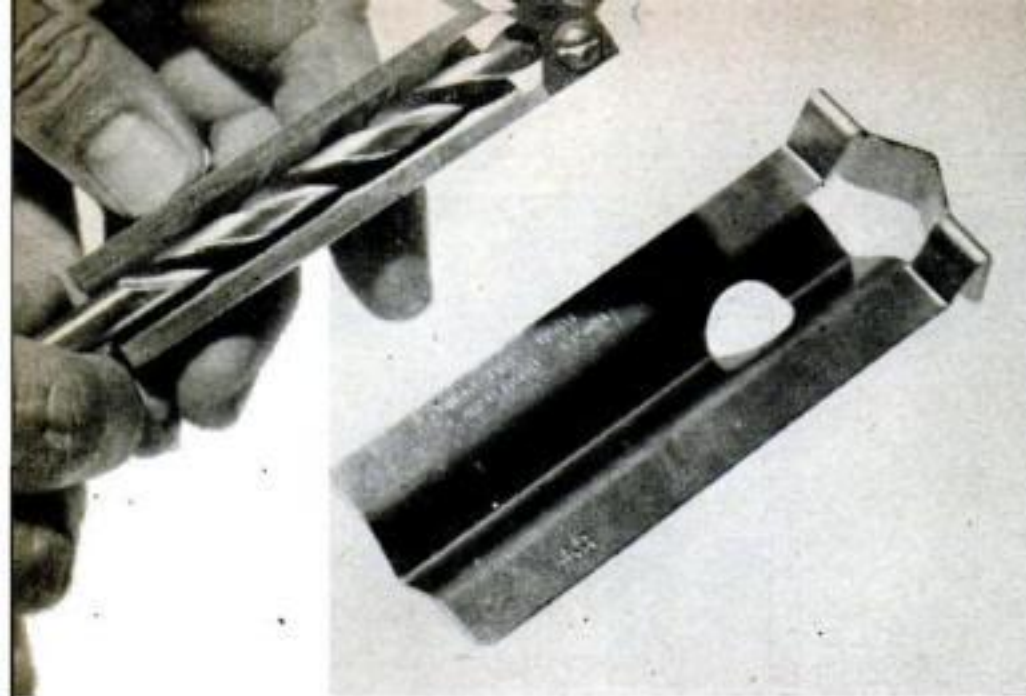


Gauge Checks Set of Saw Teeth. The tooth set of any circular-saw blade can be read to within .001" with this gauge. *PTI, Inc., New York City.*

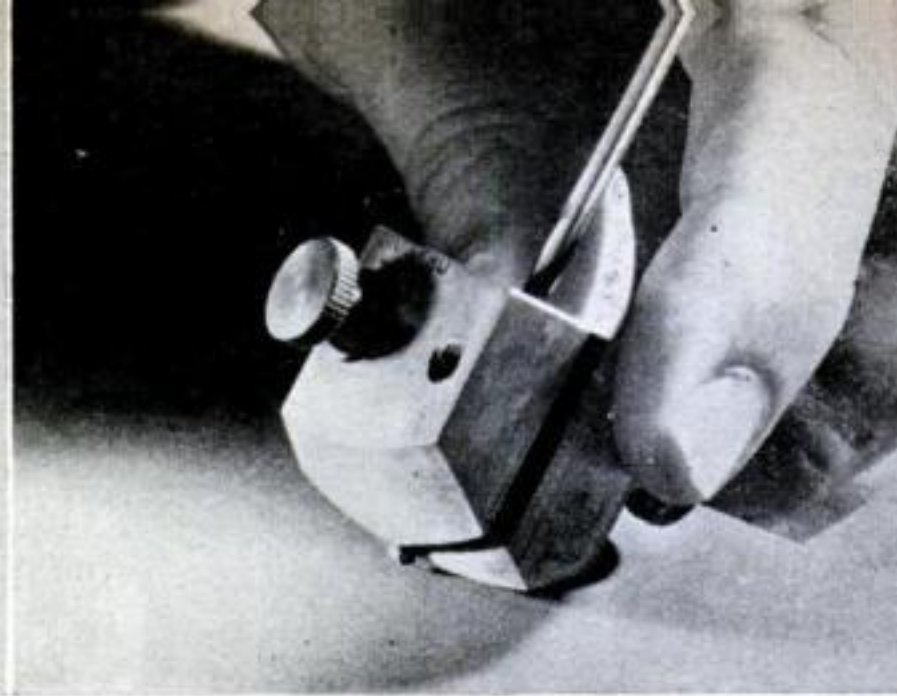


Please turn the page for more new tools.

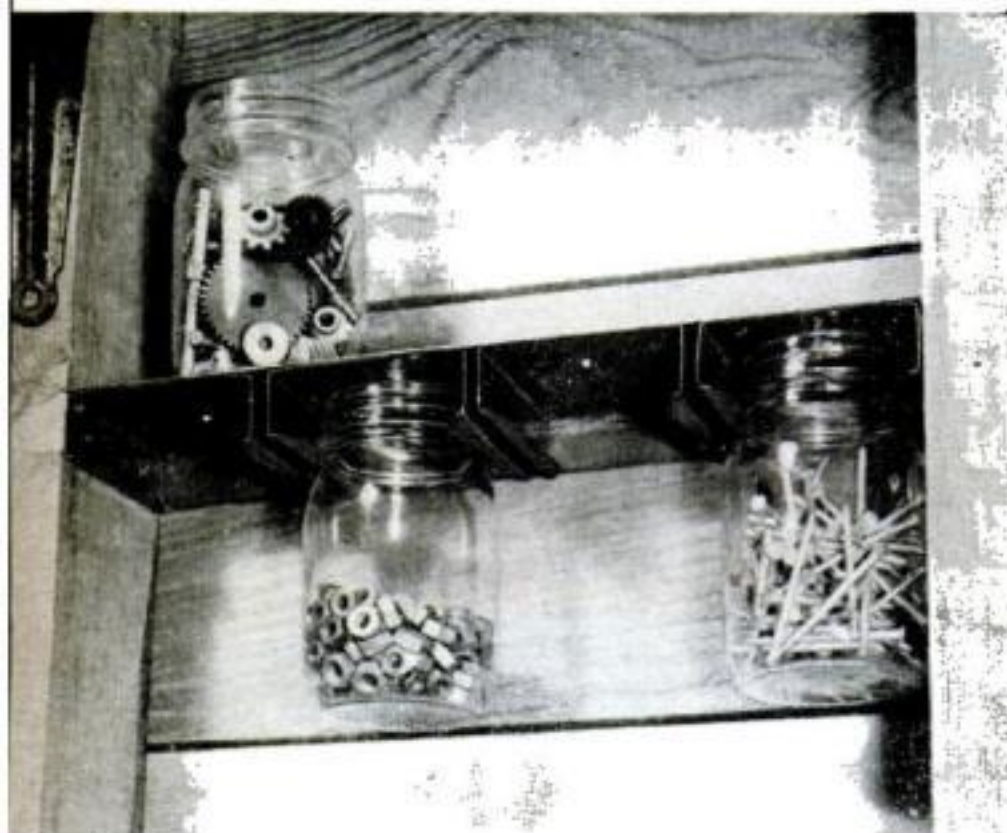
NOVEMBER 1951 225



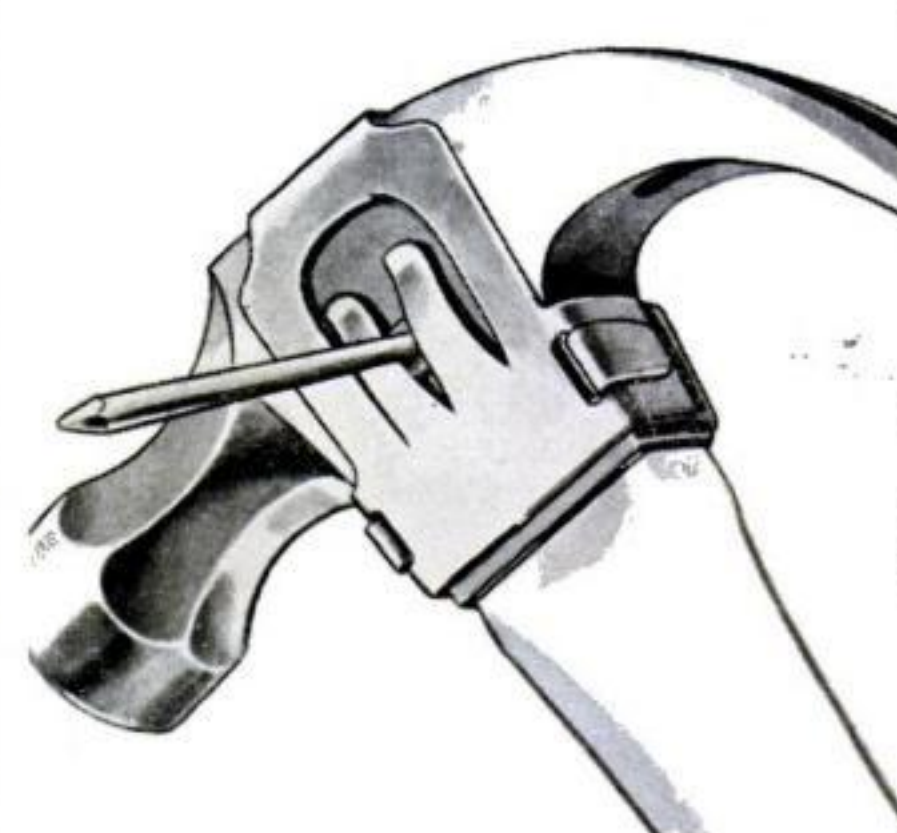
Sharpening Aids for Small Drills. The tough job of accurately sharpening small drills is made easier by these three gadgets. With each of the two gauges at left, above, you can check point angles and clearances of drills. The one shown in use is made of steel and takes drills from $3/32''$ to $3/8''$. The gauge block is removable so other blocks with different drill-point angles can be substituted.



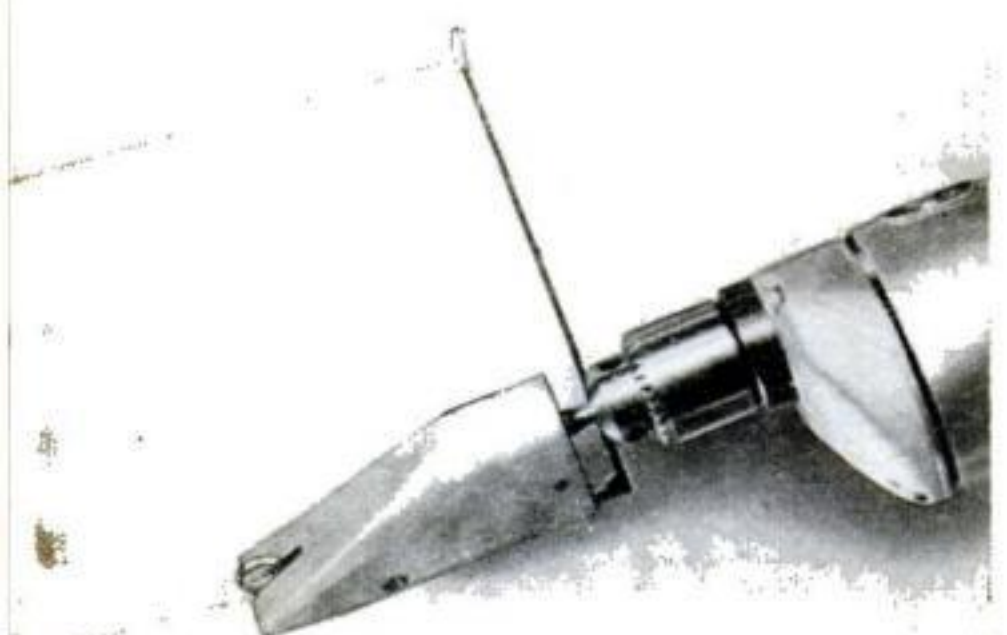
The other gauge is half-hard aluminum and takes drills from $1/8''$ to $3/4''$. It is set for the standard 59° angle. The curved bevels of the sharpener pictured at right hold the drill at the correct angle as you pass it over an oilstone. The tool is designed to put the standard 59° cutting edge on drills. It takes drills from No. 30 to No. 70. *Tingle Industries, Detroit.*



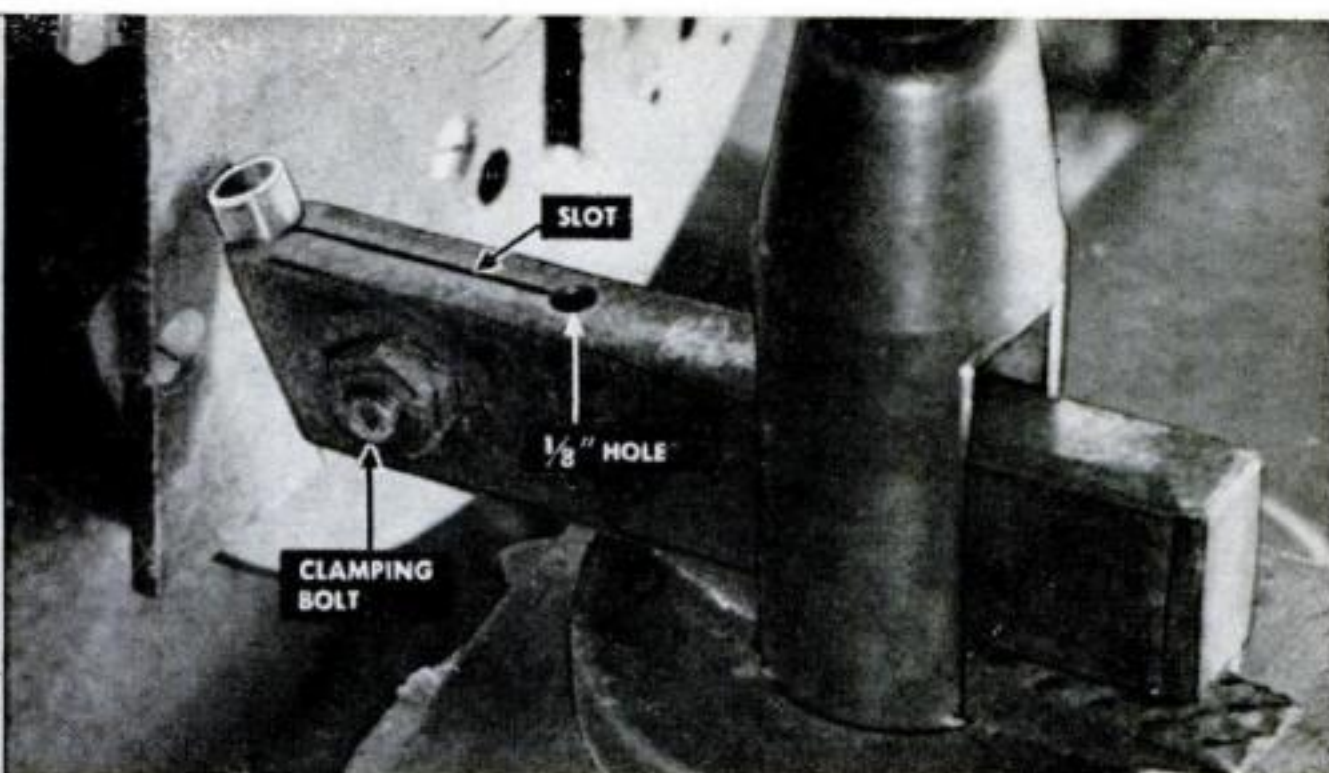
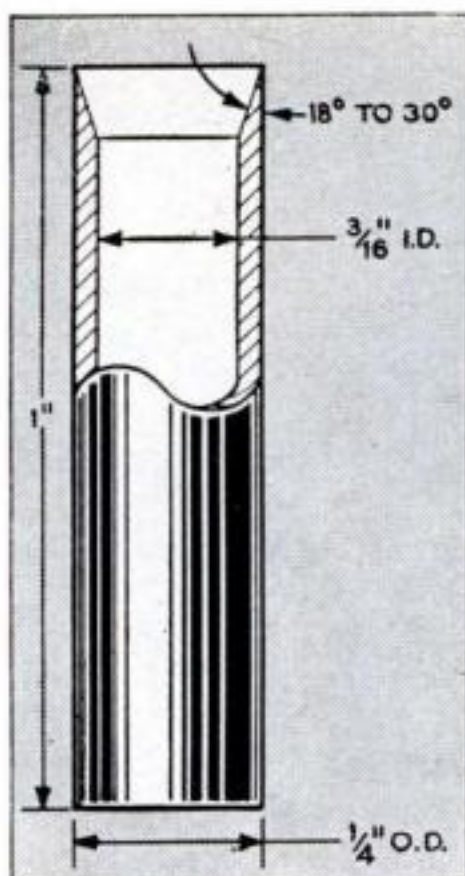
Jars Hang from Workshop Shelf. Brackets underneath this metal shelf hold four pint Mason jars for storing nails or small parts. It is designed to be mounted on a wall or between studs that are 16" on centers. *Colper Sales Co., Wichita, Kan.*



Nail Clip Acts as Third Hand. With this clip on your hammer you can start nails in spots that you couldn't otherwise reach. It provides prongs for holding nails on both sides of the hammer. *Amsco Company, Le Center, Minn.*



Drill Drives Cutter. Designed to be chucked in a $1/4''$ electric drill, this cutter for sheet metal, plastics or linoleum is made in two models—one for materials up to .040" thick and the other for work .055" thick. You don't need to work in from an edge; if you drill or punch a small hole for the blade, you can start cutting inside a sheet. *M-M-A, Inc., Lancaster, Pa.*



A sheet of molded phenolic plastic being turned on the faceplate with a tubular tool ground as shown in the drawing at left.

Sharp-Edged Tube Turns Materials to a Smooth Finish

Wood and plastic can be turned and finished in one lathe operation with an easily made tubular tool. Described in a paper by Prof. E. George Stern, Director of the Wood Research Laboratory, Virginia Polytechnic Institute, the tool is a 1" length of $\frac{1}{4}$ " drill rod. This is drilled through $\frac{3}{16}$ ", and an internal taper is ground at one end with a tool-post grinder or a hand grinder on the cross slide, forming a sharp edge.

The tool is mounted either straight or at a rake angle in a piece of $\frac{3}{8}$ " bar stock, slotted and fitted with a clamping screw. Thus it can be turned in its socket to present a new cutting edge without altering its setting. Sharpening is simply a matter of regrinding the taper. The tool will turn a true radius

equal to its own and tangential to a straight-turned portion. Accurate radius cutters of any size can be made from rod of appropriate diameter.

The fineness of the finish is governed by speed and feed, but limited only by the texture of the material. Wood will show a different finish where it is turned across the grain, whereas plastic can be turned to a high gloss equal to that of a polished surface. Since no sanding or buffing is needed, the part retains lathe-turned accuracy.

Prof. Stern points out that cutting oil could be fed through the tool directly to the cutting edge, or a suction air line connected to the tubular tool to draw dust and shavings away through it.



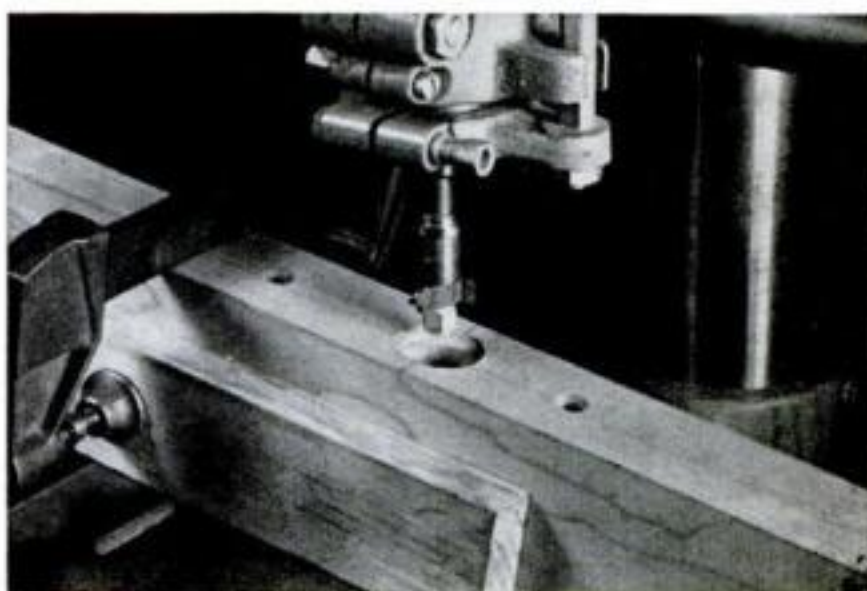
Tubular edge turns cellulose acetate (left) to a high gloss that requires neither sanding nor buffing. Yellow poplar (right) turns smooth, but shows difference in texture across grain.



Shaper Cutter Bores Holes

RECENTLY I had to bore four holes at a precise angle in a table frame for the legs, but didn't have the $1\frac{1}{4}$ " machine bit needed. This simple dodge worked fine.

First I drilled the holes with a 1" wood bit in the drill press. Then I used a wood-shaper cutter to bore the holes to size. To prevent burning the cutter, the drill press was run at the slowest speed. I turned the leg tenons to fit the holes.—G. A. Wagner, Delmar, N. Y.



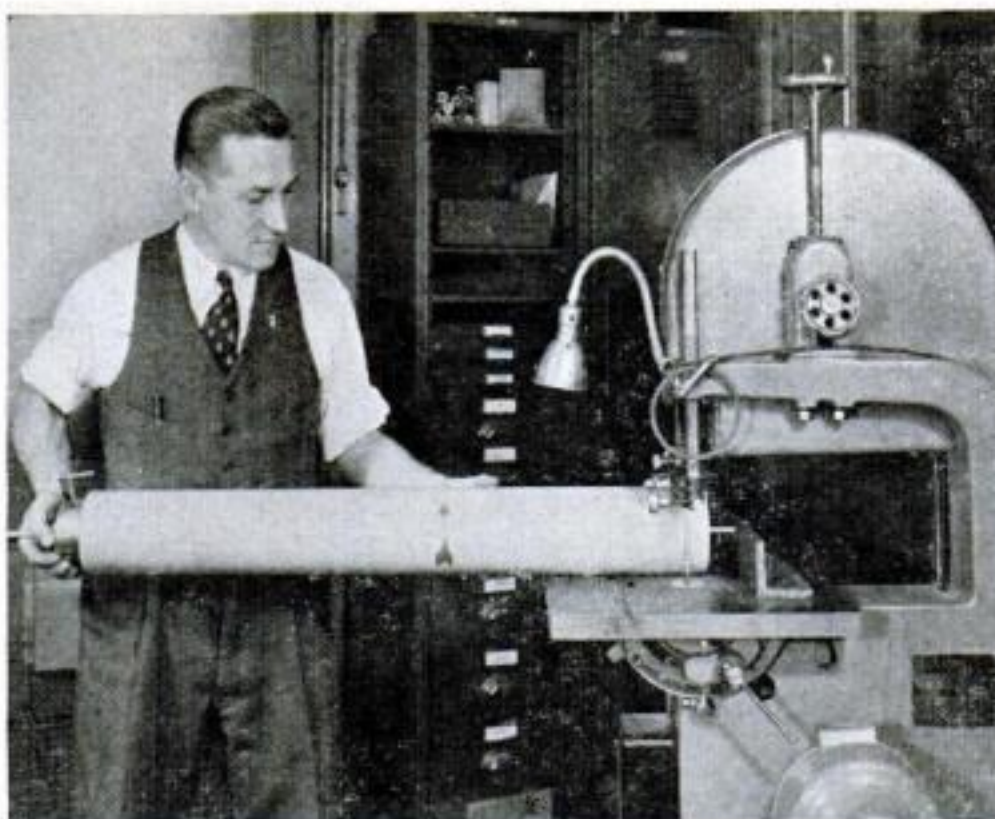


New Shop Ideas

Bandsaw Subs for Lathe. Squaring the ends of large-diameter tubing, or turning off rings of uniform width, ordinarily calls for a good-sized lathe. But with a long rod centered in two disks, you can handle these jobs on a bandsaw or circular saw.

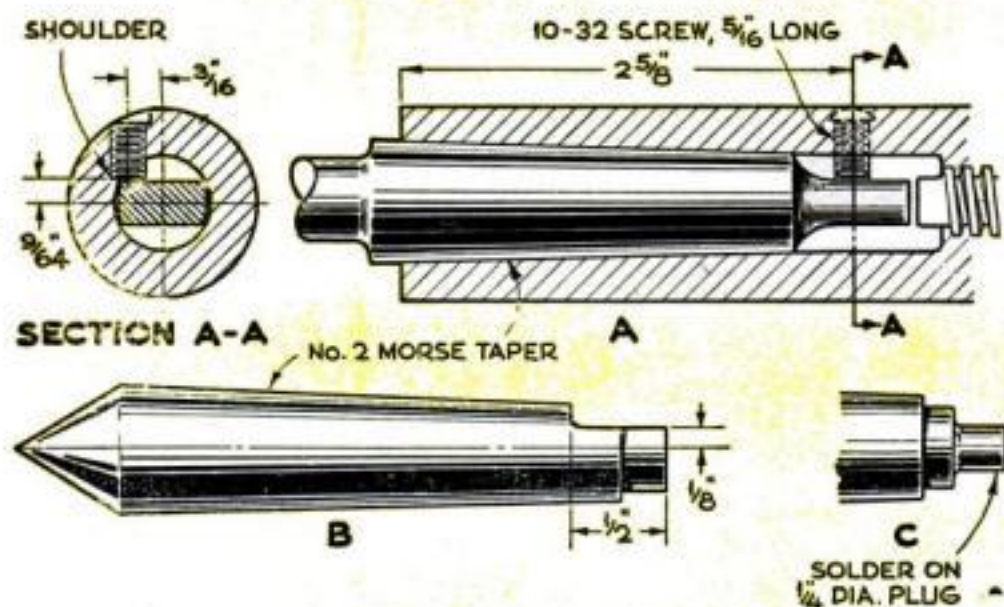
The disks should fit inside the tube closely and have accurate center holes. At least one disk must have provision for clamping the rod fast. In the photo, a disk is being used at one end and a three-jaw universal chuck at the other. The spindle hole of the chuck was fitted with an adapter that was bored to suit the rod and drilled and tapped for a clamping setscrew. Using the chuck eliminates the fitting of a second disk.

One end of the rod is rounded to a blunt point. It extends past the end of the tube to bear against a vertical face clamped to



the table. A true cut is obtained by cutting only through the thickness of the tube, and then revolving it against saw-tooth travel. Rings $1/16''$ wide have been cut this way.

The setup may be used to cut annular grooves by clamping a second stop against the upright to limit movement toward the saw.—*Frank Reck, Flushing, N. Y.*



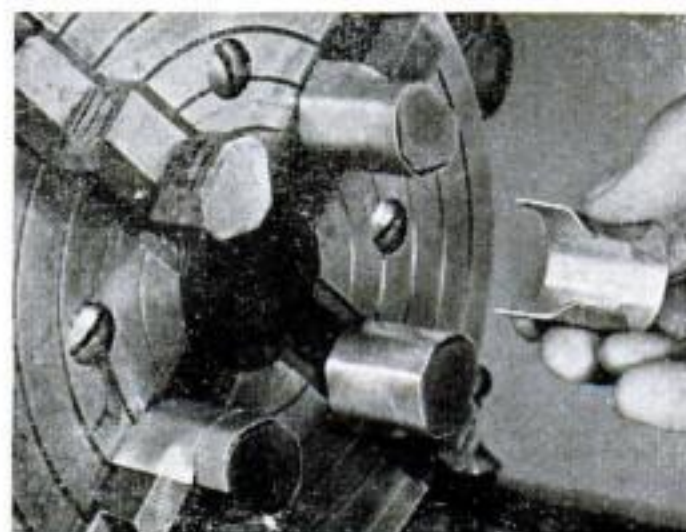
Locking Taper Shanks. When taper-shank drills twist in the tailstock socket, the internal taper may be permanently damaged. Holding the drill with a wrench is uncertain. Besides, this takes a hand you may need elsewhere.

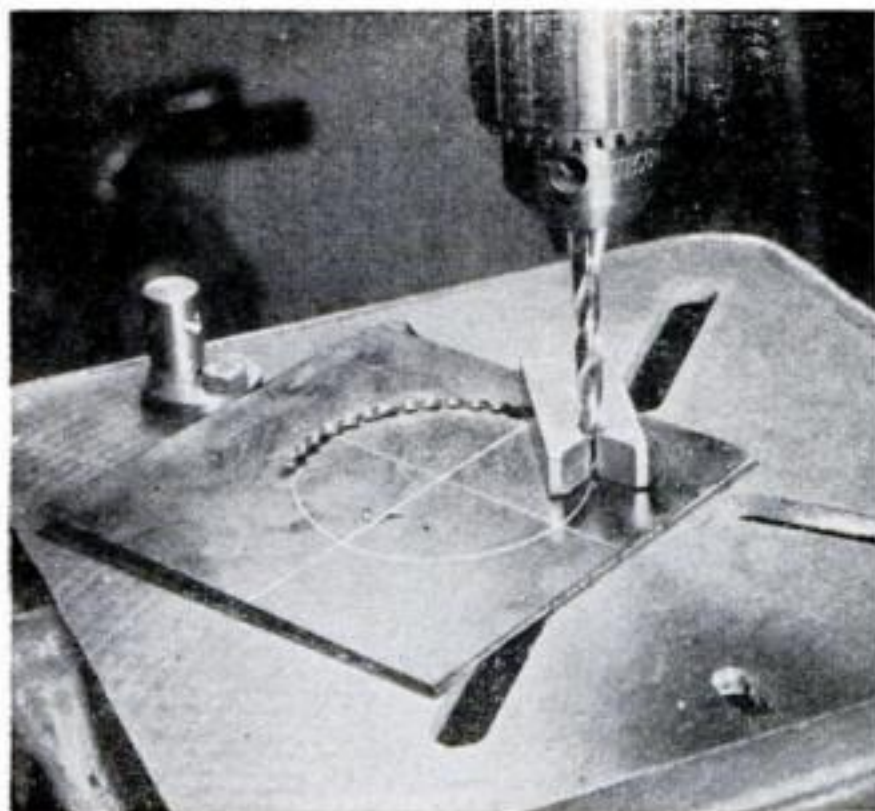
For a permanent and sure lock to prevent taper shanks from turning, drill and tap a hole for a 10-32 headless setscrew in the tailstock ram as shown above, locating it $3/16''$ off center so that the screw will bottom against a shoulder. Clearance of $1/64''$ should remain between it and the tang of an inserted drill.

If the screw prevents centers or other tapers from seating, grind clearance on them as at B. Should it prevent ejection of short shanks, solder small plugs on as at C.—*Bernard J. Corey, Thorold, Ont.*

Clips Prevent Scoring. It's common practice to wrap shim stock around finished shafts to keep chuck jaws from marring them. But when you have to handle a lot of pieces, the extra operation becomes a time-consuming nuisance.

The shims shown below have to be put on the chuck jaws only once for a run of work, and save a lot of fussing. Cut them from soft sheet copper, with two slits about a third of the way from one end. Hold them on by clamping something in the chuck. Then tap each shim into shape over its jaw with a soft hammer. The clips stay put, but can be slipped off in a moment.—*Harry L. Truchelut, Atlanta.*



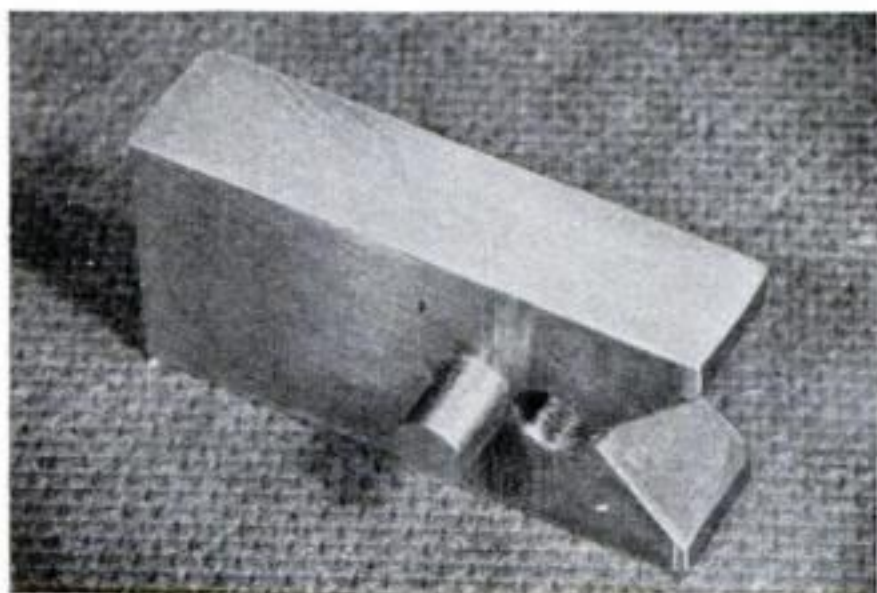


Overlapping Holes. One easy way to cut a big opening—by drilling a series of holes around it—is often hard in practice. The drill tends to fall into the preceding hole, or if the holes are spaced farther apart, the metal between must be chiseled away. And the ragged opening calls for considerable cleaning up.

This jig will produce uniformly overlapping holes, with no tie between. Clamp a $\frac{1}{2}$ " by $\frac{3}{4}$ " by $1\frac{1}{2}$ " piece of steel on the drill-press table and carefully drill two holes, with the desired amount of overlap, near one end. File or mill a notch in from the end so that it just nicks the outside hole.

Make a $\frac{3}{8}$ "-long pin a drive fit in the inner hole, with the $\frac{1}{8}$ " that will project slightly smaller. File a flat along the pin. Drive it in with the flat facing the other hole so that the drill may enter freely.

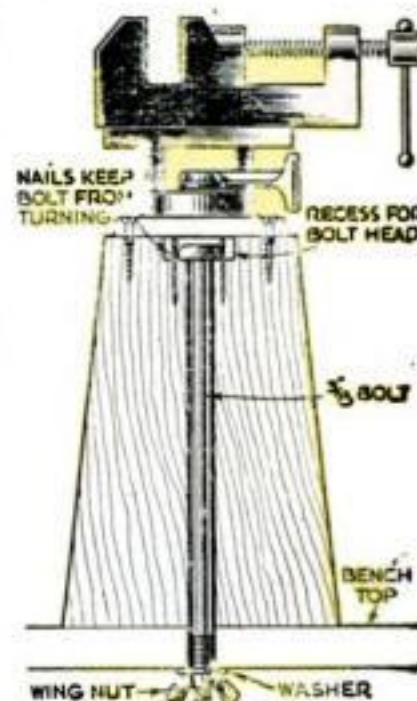
To use the jig (shown in close-up below), punch-mark and drill the first hole. Drop the pin in this, and center the jig on the layout line by sighting into the notch. Repeat for each hole. For production work, the jig should preferably be hardened.—*Will Thomas, Buffalo.*



Close-Up Vise. Preferring to do delicate work near eye level, I made this bench-top support for my swivel-base drill vise. It is a truncated cone turned from wood. A long through bolt clamps it on the bench.

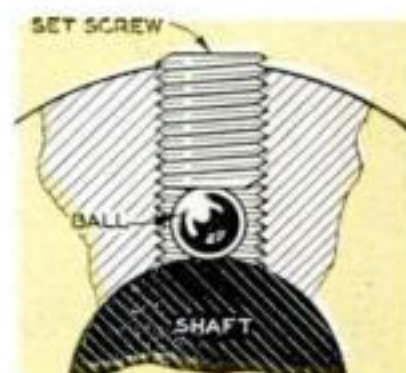
The swivel base of the vise is secured with wood screws. It takes only a moment to attach the vise or, by loosening a set-screw, to detach it for use on the drill press.

Instead of a wooden support, you might weld ends into a 7" length of 3" pipe, tapping holes for hold-down bolts, or simply screw two floor flanges onto a piece of $1\frac{1}{2}$ " pipe.—*Carl Tretin, Austin, Minn.*



Ball Protects Shaft. In trial assemblies, frequent tightening of a setscrew may mar a shaft enough to make it jam in close-fitting bearings or pulley bores. A steel ball under the setscrew will prevent this. Use the largest ball that will enter the hole freely.

As the screw is tightened, the ball will make only a small dimple on the shaft. This doesn't project or enlarge the shaft. But you can use it to locate a flat to be filed for the setscrew. Remove the ball when making the final assembly.





RADIATORS Those lined up before the headquarters of this wrecking company in Yonkers, N. Y., sell for \$1.10 a section. All of the photos on these pages were shot at this shop.

You Can Get Bargains from a House Wrecker



One man's junk is another man's prize. Haunting house graveyards is one way to beat the high cost of home improvements.



STAIRS This stairway would sell for around \$10—complete. Railing above would go for \$20. Lumber in background is only a small part of yard's stock of used beams, studing, flooring, siding, sheathing and molding.



DOORS Complete with hardware, they sell for \$4 and up (for one that would cost \$12 new without hardware). Often you can buy a fitted frame and door jamb too. If you don't find a door the exact size you need, pick one slightly larger and trim it down.

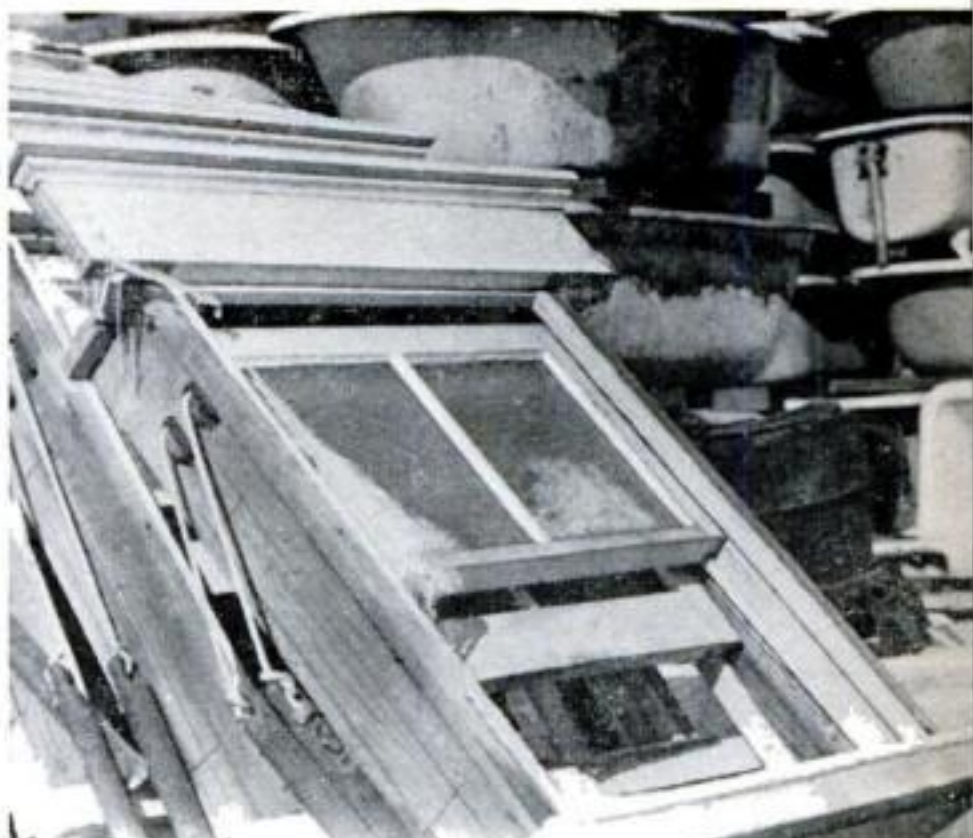


OIL BURNERS Some of them may need a complete overhaul, perhaps several new parts, but a price of approximately \$25 may make a used burner a good bet.

THERE are two parts to a house wrecker's business. He tears down old homes and other buildings. And he sells the lumber and other items he has salvaged.

You can cash in on the second part. Lumber, for instance, usually goes for just plain half price. You may have to pull out the nails—but your labor will be well rewarded. You'll have seasoned wood at a big saving over the cost of new lumber, which incidentally might still be green.

A wrecker's contract often includes every-



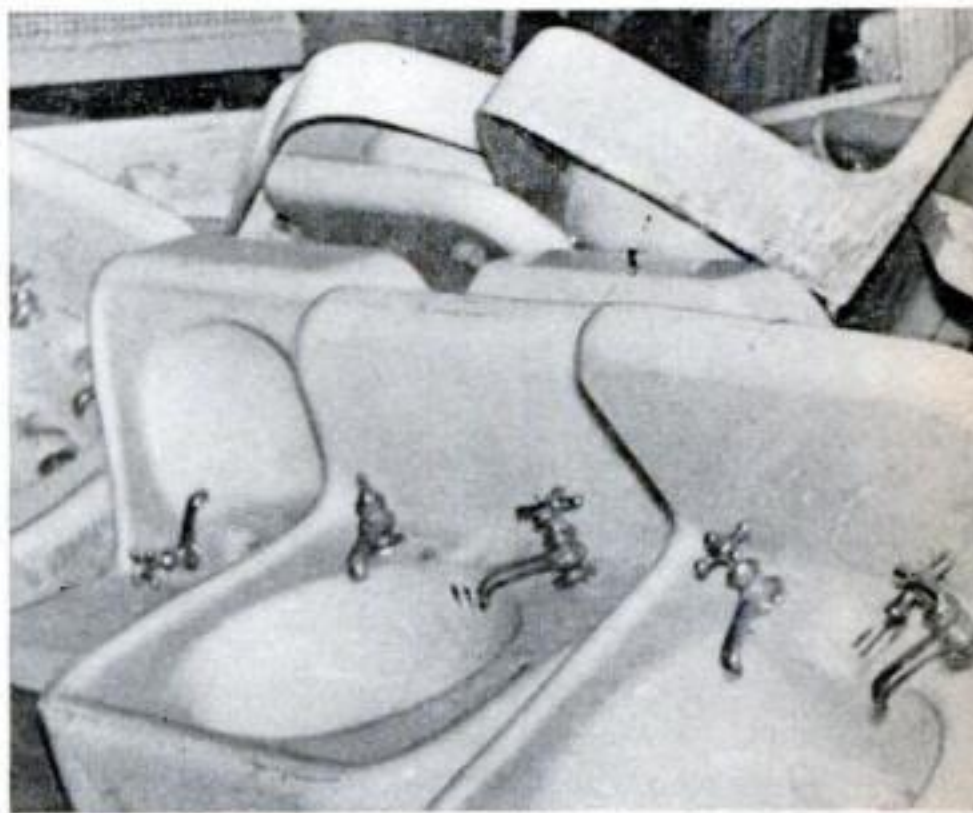
WINDOWS Units like these, complete down to sash weights and cords, are available in all types. They sell for about \$8. Some good bathtub buys in background.

thing, right down to the shrubbery. That's why you can find just about any item under the sun in a wrecker's yard.

To locate the wrecker who operates in your neighborhood, ask around where a gas station or store has recently risen on the site of a fine old house. Chances are you'll find someone who remembers who it was that pulled the old place down. The wrecker may have come 30 or 40 miles to do the job, but in most cases he's willing to deliver whatever you buy.



SHUTTERS All types and sizes are on hand here, from giant old slatted models to trim little cottage types with cutouts of crescents, pine trees and stars. Prices range up from \$3.50. And if you'd like a carved mantel, you'll find a good selection of those too.



BATH UNITS Wash basins like these range between \$10 and \$18. You'll also have a choice of toilets, bathtubs, kitchen sinks, and stationary washtubs. Most of them come equipped with fittings, another saving to you.

How to Judge Used Power Tools

PART 2

Here are practical pointers that may help you spot trouble before you buy it.

By Darrell Huff

PLANNING to buy a used circular saw? Or jointer, sander, or shaper?

You'll need to know three things about it: Is it the type of tool for *you*? What shape is it in? And what kind of quality was built into it in the first place?

On that last point the manufacturer's name is your first lead. Your second is the manufacturer's literature. From the latter you can learn a good deal about how well the machine in question was built originally.

Begin with the bearings. Are they the sealed kind that have been lubricated for life? If the maker's specifications say they are, you'll know that they have not suffered

from lack of lubrication. And they will be easy to replace if that turns out to be necessary.

If they are the unsealed type they may be just as good—provided they have been periodically greased or oiled. Inspect to see if they are dry.

Second question is looseness in a bearing. This may be a product of wear, and can only be corrected by replacement. Or it may be that the bearing has lost its preload. See if the preload adjustment can be made through a collar or cone. If not, and if the bearing is not replaceable, the machine is practically useless.

Finally, beware of a freshly enameled machine. New paint may hide a crack.

Circular saw: Look out for a cracked table and worn bearings

DECIDE first if this one is big enough for you. Big has three meanings here: Depth of cut, horsepower of motor, area of table.

If you're going to build houses with it, you'll likely prefer a 10" or 12" saw with plenty of table and at least a $\frac{3}{4}$ -hp. motor. But for most home-workshop jobs an 8" saw will have enough depth and a half-horsepower motor will power it.

Now for the details:

1. Is the saw table cracked or warped? Check it with a straightedge. If it is dam-

aged or off-flat, you don't want the machine—unless a replacement table is available at a reasonable price. A look at the underside of the table will tell you how well it was built; heavy ribbing is more important than thickness in giving strength.

2. Examine rip fence and miter gauge. Adjust the fence to see how easy it is to use. Is the miter gauge accurate, and can it be adjusted to accuracy if it is not?

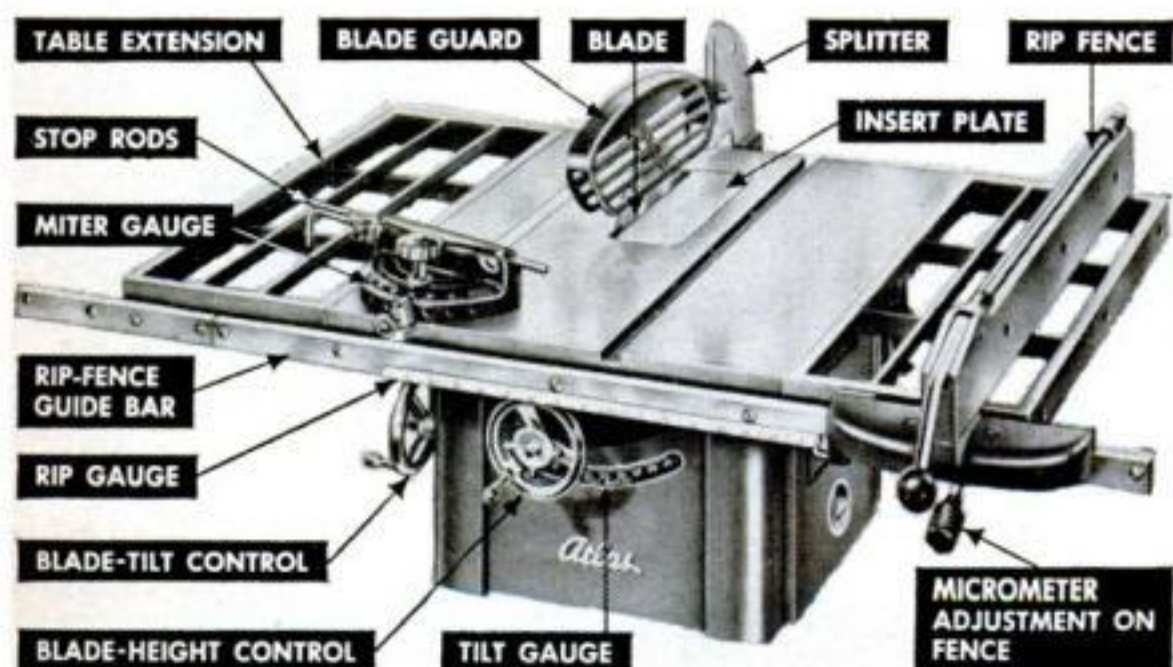
3. Inspect the arbor supports and trunnions, watching closely for inconspicuous cracks. Trunnions can be replaced but you'll want to figure their cost into the price you are paying.

4. Work the controls that tilt the saw arbor or table. They should work freely or they'll be a nuisance, and you may be in for trouble.

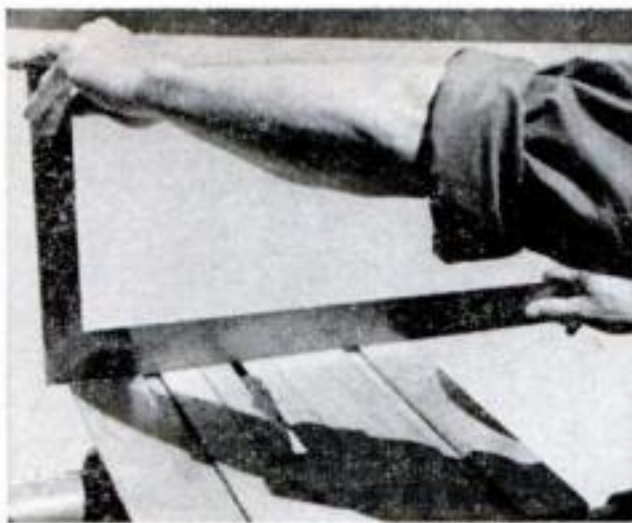
5. Actually use the saw if power is available. If there is any hidden damage, your ear is likely to find it for you.

6. Look for lateral play in the spindle. Such play usually indicates worn bearings.

7. A loose pulley on the

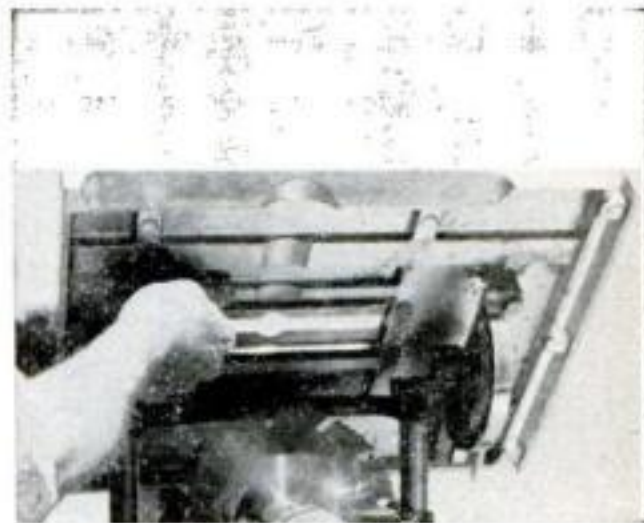


These are visible working parts of typical circular saw. Check them for suitability, size and working condition.



Accuracy of the saw table is important and is easy to check. Use a straightedge or framing square (left) that you can trust.

What you see from underside (right) is clue to quality and condition. Heavy ribbing indicates saw table that is likely to stay flat.



end of the spindle is apt to have scored the spindle shaft. Inspect to see if you're going to have to buy a new spindle.

8. Check to see if the blade aligns with the table grooves. Run the blade all the way

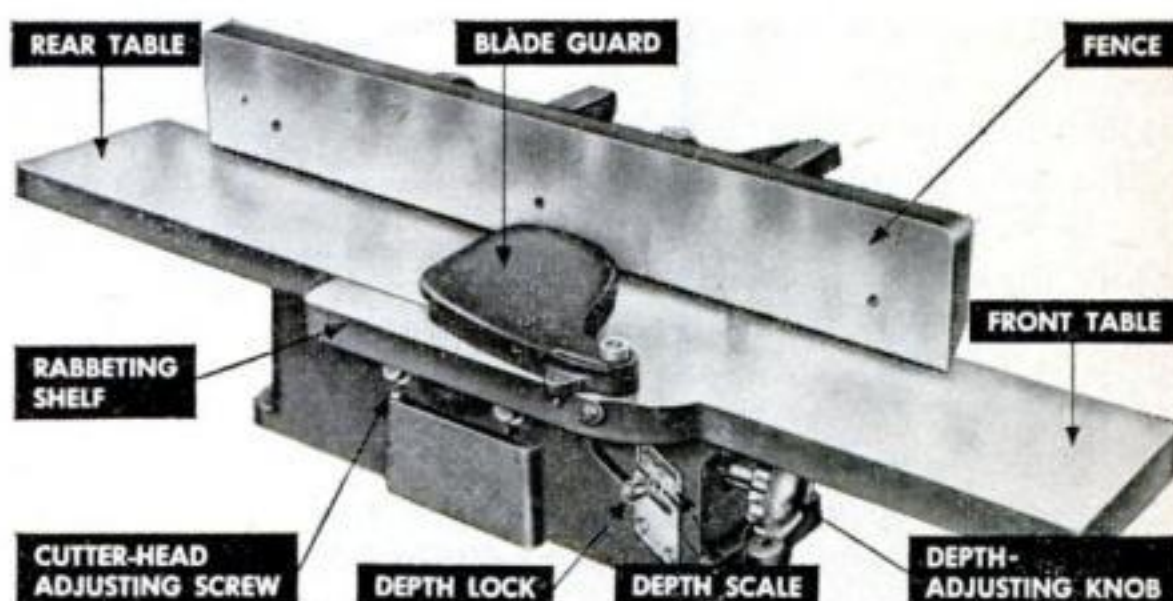
up. Lay a straightedge against it. Then measure from both ends of the straightedge to the grooves. The distances at both ends should be the same. Sprung trunnions can cause the blade to be out of line.

Jointer: Do the controls work smoothly? Is the table warped?

ANY well made jointer in good condition will do its main job—producing true, flat edges, the kind you need when glueing up stock. But if you want it for other tasks, you'll have to examine it with these in mind. A good jointer is handy for beveling, chamfering, rabbeting and for surfacing lumber. A jointer is not a thickness planer, but you can make a 6" model do a pretty good job of surfacing stock up to 12" wide.

If the capacity is right for you, look at the adjustments. Individual height adjustment of both tables is handy, permitting such operations as spot chamfering. Sealed-for-life ball bearings are important—they'll save you a lot of trouble. If you have the manufacturer's catalogue, see if the knives are high-speed steel. Then start checking condition.

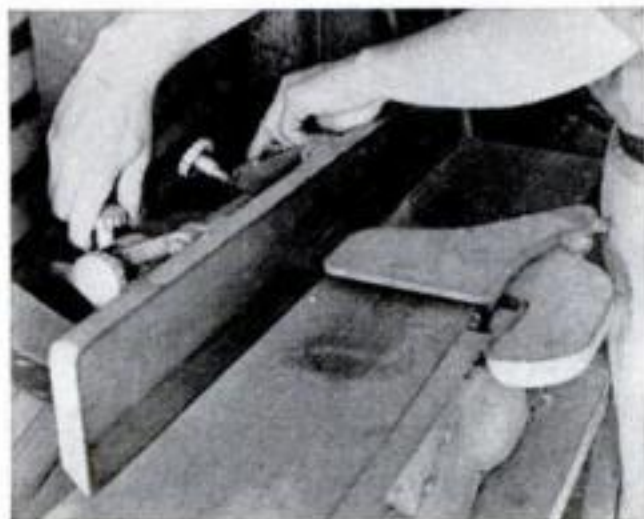
1. Work the various knobs that control the tables to see that everything operates smoothly.



Important parts of jointer are shown above. Check these first: tables and fence for trueness; controls for easy working.

2. Use the fence adjustments. They should loosen easily and lock tightly. A jointer fence that creeps out of square or moves under pressure can ruin a lot of lumber before you discover it. And the fewer the knobs needed to control these adjustments, the handier and more trouble-free the machine is likely to be.

3. Try the spindle for lateral play. If you can wiggle it up and down or from side to side, the bearing housings may be worn



Do fence adjustments (left) work easily and lock tightly? Negative answer to these questions indicated this machine was a poor buy.

Test the setscrews (right) that hold blades in cutter head. A screw that is frozen or broken off means trouble, maybe a new head.



so badly accurate work is impossible.

4. Use a straightedge to check for warping of the table. You might as well abandon any jointer with a bowed table. Also bring the tables to the same level and check diagonally—from corner to corner both ways.

5. Search for broken castings. Small ones can usually be replaced at minor cost, but be sure replacements are to be had before you buy.

6. More than likely the knives will need sharpening. Can they be sharpened and

then locked again *safely* in the head? Or should you add the price of new knives, and maybe a head as well, to the cost?

7. Try removing the screws that hold the blades in the head. If a screw won't come out, it may be broken. Removing a broken screw can be quite an operation and there's little use buying yourself into grief like that.

8. Buying a jointer without a blade guard is buying a hazard for your shop. Be sure there is a guard and that it works.

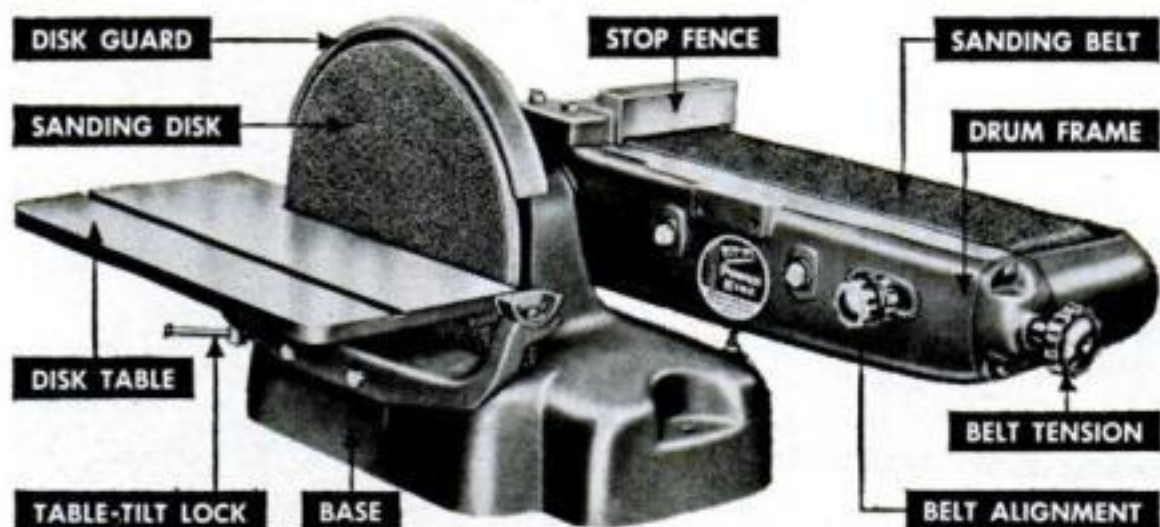
Sander: Suitability to your needs is the first consideration

THE question of suitability to your particular needs hinges mostly on whether or not you will own more than one kind of sander. If, for instance, you will have a disk sander available (or if it comes in combination with a belt sander) you won't ask the belt model to do any tricky operations. You'll use the latter mostly for sanding surfaces and edges of lumber.

But if you expect the belt finishing machine to do the work commonly done with a disk, then it must have the proper table, one that will tilt within an adequate range. Accuracy is important, since you can use a sander to true up all sorts of cuts.

1. On the belt machine, examine the drums for cracks. If you can run the machine, see if it tracks properly. A sanding belt that won't stay in position as it runs often indicates a bent shaft. Make sure all the tracking controls are in good order.

2. Excess vibration in running is another

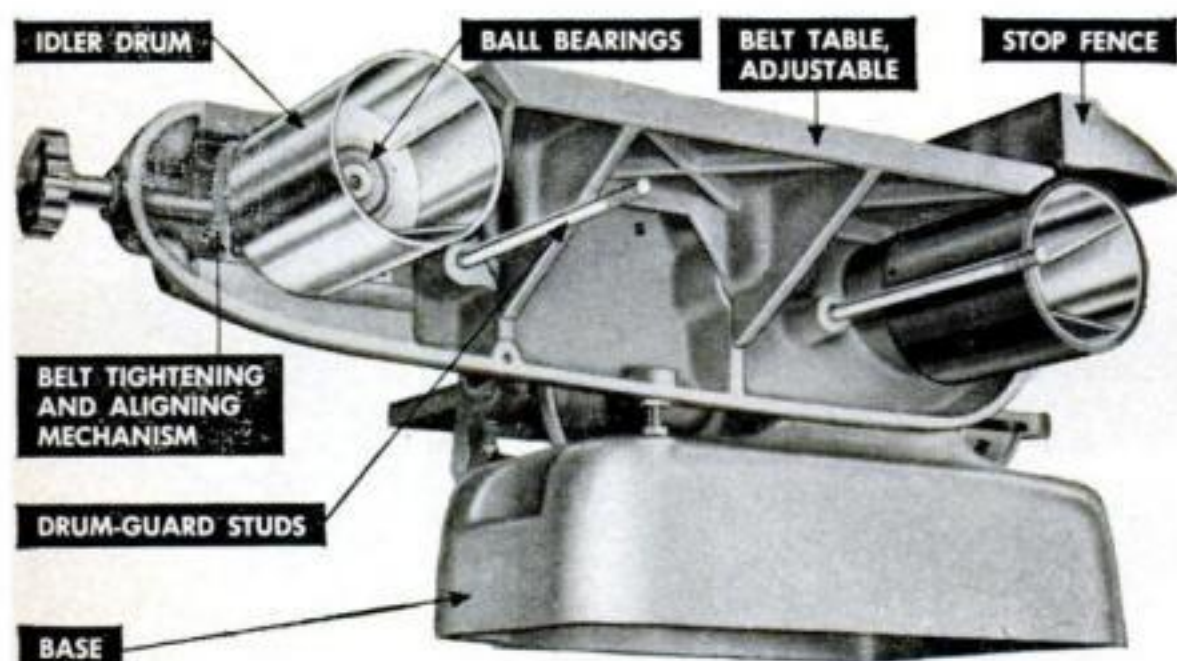


Common types of bench sanders for home shops are the belt, disk, and a combination of the two, which is shown above.

indication that some part may be out of true.

3. You can best check a disk sander (or the sanding disk on a combination sander) by running it. Listen for vibration. Let some object rest on the table while the machine is running; bad vibration will make the object hop around. At best, such a machine is no fun to use.

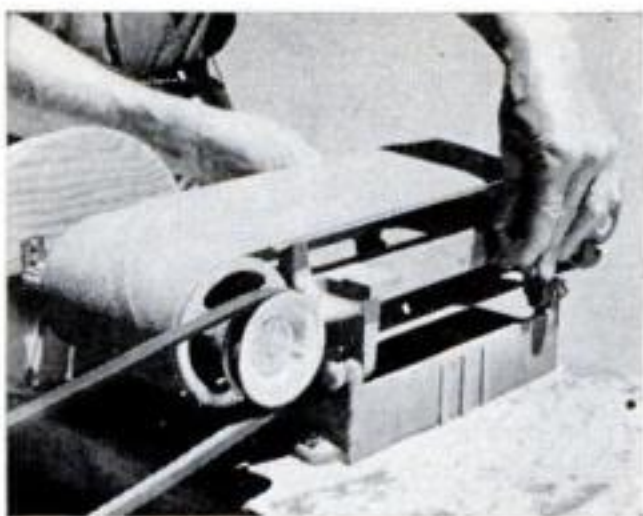
4. With a portable belt sander, design is an important consideration. Will the sander work close to an edge? Will it get into corners? For some jobs, these are prime questions, but if you intend using it merely



Examine the drums and tightening mechanism shown here. Look for cracks and worn parts that make tracking unreliable.

Worn guides that may be hard to replace were found when this portable belt sander was opened. Note that cover plate has been chewed by the belt.





This buyer is trying condition of tightening knobs (left). Jagged casting may indicate that belt has often failed to track properly.

Bad vibration (right) is a serious flaw in a sander. If you can't find a way to correct it, don't give much money for the machine.

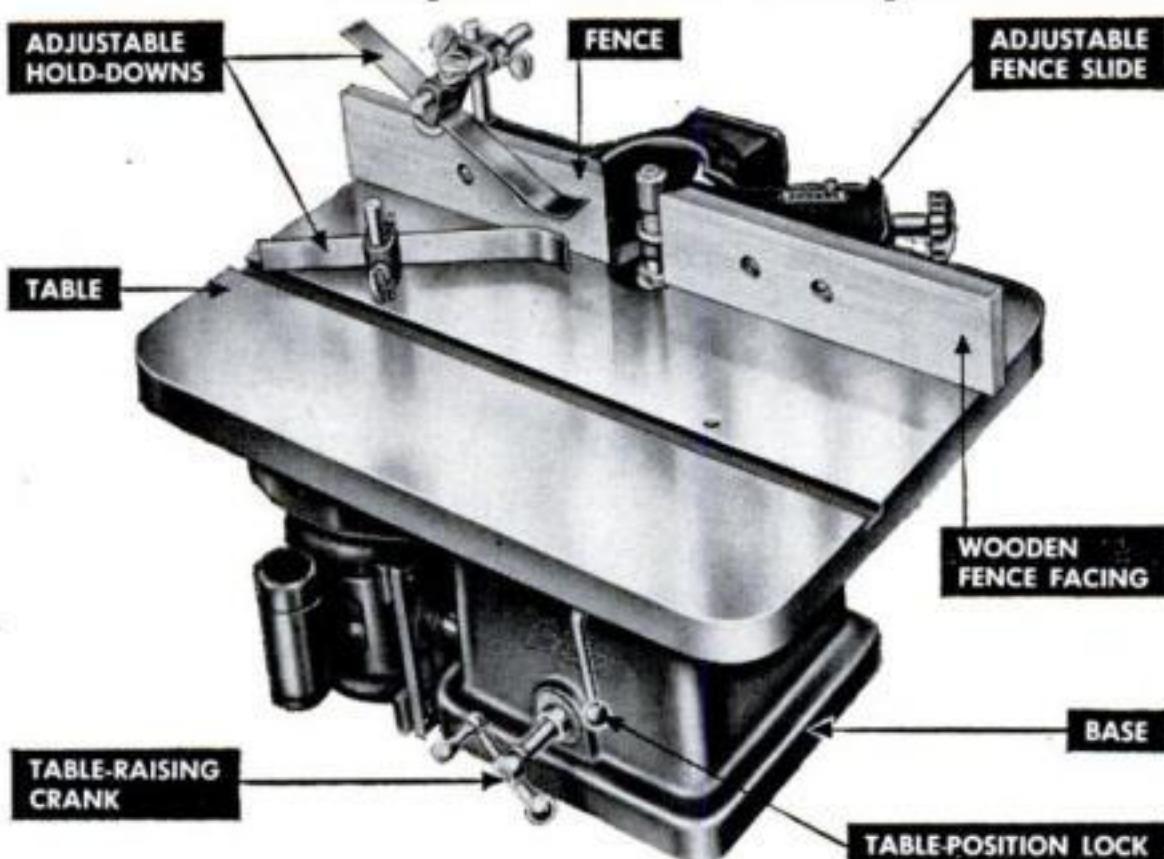


to take down table tops, they make little difference.

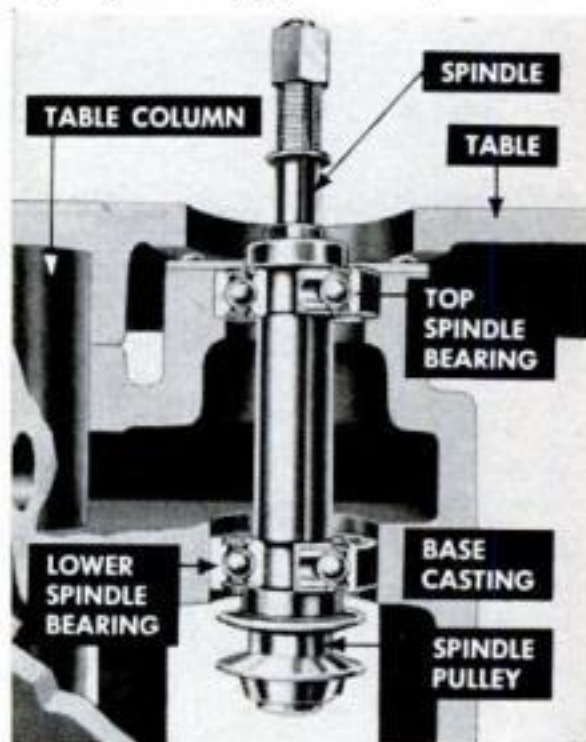
5. In many portable belt sanders, the condition of the guides will tell you a good deal. Open the machine up and inspect the surfaces against which the edge of the belt

may bear in running. If the machine tracks badly, these may be cut and so may the housing. With any machine having a motor built in, the condition of that motor is probably the major factor. We'll discuss that in a minute.

Shaper: Check the spindle for lateral play



Heart of shaper is shown in cutaway photo below. Make sure spindle threads are in good condition. Check bearings by trying to wiggle the spindle.



Here are the controls that need to be checked for easy and positive working. Straightedge will tell you if table is flat.

By the time you get to needing a tool like this, you probably know what you want it to do. But there are a few points about condition to remember.

1. Look first at the spindle threads to be sure they are not damaged.

2. Check the spindle for lateral play. If you can move it at all from left to right, it's a good guess that bearings or bearing hous-

ings are badly worn. The machine will need a repair job before it will cut satisfactorily.

3. Try the controls to see that they are functioning, and also note how many cutters there are and their condition.

4. Wind up with the usual operating test if power is available. And, in any case, examine closely for cracked castings, cracked or out-of-true table, and the like.

Motor: Is it powerful enough for the job it has to do?

In many tools, the motor is the important thing. This applies especially to portable drills, disk sanders, and grinders, where there are few moving parts outside the motor itself. It applies pretty much, too, to portable sanders, flexible-shaft setups, and

to some extent to radial-arm saws which have motors built into them. And, of course, a motor is very often part of the purchase.

Unfortunately it is not often feasible under buying conditions to tear down a motor sufficiently to examine it thoroughly. You



Smell test often will give reason to suspect internal trouble. Off smell indicates partially burned windings and a damaged motor.



If motor shaft won't turn freely, something is wrong with shaft or bearings, or motor has been torn down and then reassembled incorrectly.

have to rely pretty much on external clues.

1. Power is the first question. If you are offered an 8" circular saw equipped with a $\frac{1}{4}$ -hp. motor, you might as well figure on replacing it. Check the power given on the name plate and compare it with the recommendations of the maker of the tool. Remember that these are figured for average conditions; if your tools are dull or you are doing heavy work, you may need more power. The following power figures are usually recommended, the smaller figure applying to smaller tools or fairly light work, the larger figure to heavy work:

8" circular saw, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

10" circular saw, $\frac{3}{4}$ or 1 hp.

4½" jointer, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

6" jointer, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

Bandsaw, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

Shaper, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

Belt and disk sander, $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

Lathe, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

18" jigsaw, $\frac{1}{4}$ or $\frac{1}{2}$ hp.

24" jigsaw, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

Drill press, $\frac{1}{2}$ or $\frac{3}{4}$ hp.

2. Read the name plate to be sure that the motor will work on your current, which is probably 115-volt, 50-60 cycle, single-phase. A three-phase motor is often cheaper, but many homes are not wired for that power. On the other hand, you can use a 220-volt motor to advantage if you have a three-wire supply running to your shop.

3. If the presence of oil holes indicates that a motor is not equipped with sealed bearings, look to see if it shows signs of having been kept lubricated. If you are going to use the motor in a vertical position—as with almost all drill presses—it should be the sealed type. In addition, a drill-press motor should be a ball-bearing type; or, if a sleeve-bearing, it should have an end-thrust bearing.

4. Some kinds of trouble show up on the outside. Inspect for broken or cracked mounting or end plates, bent shafts or burned lead wires.

5. Test for bearing trouble by trying to move the shaft up and down; any movement indicates worn bearings. Turn the shaft by hand; if it does not turn freely, you can suspect bad bearings, a bent shaft or an improperly assembled motor.

6. Availability of winding leads to permit reversing the motor is another desirable feature, though not always needed.

7. After completing the tests above, plug in the motor and turn it on. It should start briskly, come up to full speed quickly, and if it is a repulsion-induction type there may be a distinct click as the starting switch cuts out the starting winding. The motor should run without much heating. Signs of internal trouble: slow starting, slow running, smoke, noise.

8. Give it a smell test. Any strange smell suggests partially burned winding and a damaged motor.

9. If the motor refuses to start until you set it off by turning the shaft by hand, it probably has a dirty or burned-out starting switch, burned-out starting windings or a defective capacitor.

10. Excessive sparking in a universal-type motor tells you the commutator needs turning down and the mica separators should be undercut. This job costs only a few dollars, so it is not necessarily a fatal defect. But there is the risk that it may already have been done to the motor so many times that there is little copper left. It's usually hard to tell about this matter without removing one end bell. END

Slicked-Up Tools Work Better

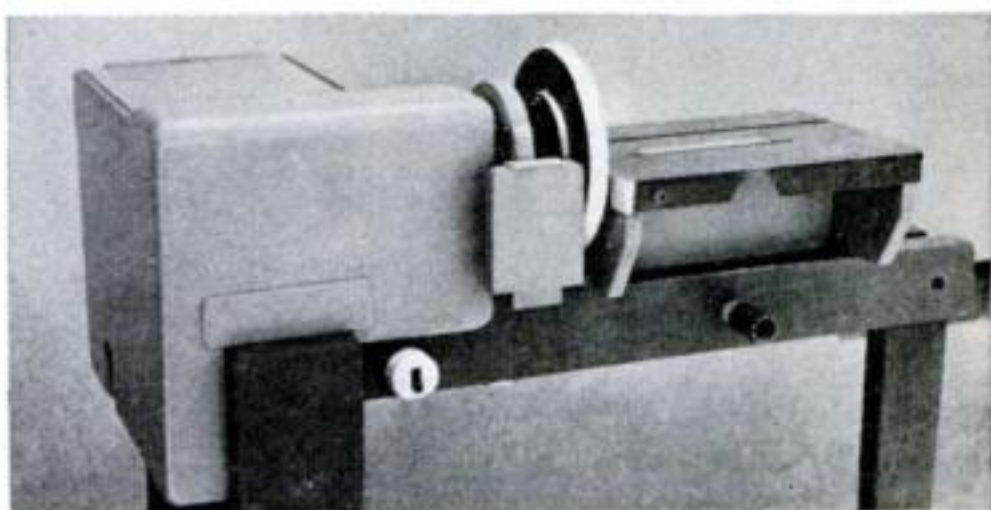
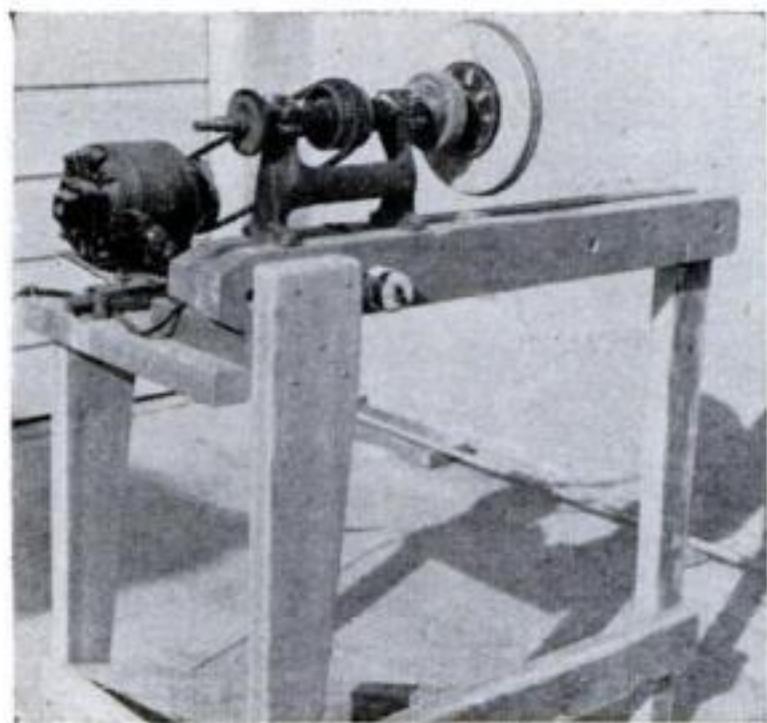
You'll probably snicker politely at prettying up a lathe, but look what a face-lifting job can do for the old machine.

WHY shouldn't a good but old-fashioned machine tool look handsome? If you've bought a secondhand power tool, for instance, you can not only streamline its appearance but also add practical advantages.

Take the case of the disk sander and grinding wheel shown here. Adding a neat cover to the arbor and motor made the machine safer. The flat top of the cover also is handy for parking work or tools. The addition of a tool rest by the wheel and a big

sanding table made the machine more useful too.

My lathe also is much more practical since I mounted it on a cabinet. Wood from the old box on which it stood was reworked to make the cabinet. The legs are short pieces of 2" by 8" stock, and the plywood doors were salvaged from an old chest. I filled holes and cracks in the old lumber, sanded it smooth and then painted it.—*Robert Hop-pough, Encino, Calif.*



Original sander-grinder setup (left) did same jobs as glamorized version (above), but the new version looks better and is much safer to use. Cover keeps fingers and ties out of belt, and grit out of bearings. The sanding table was salvaged from an old circular saw.



On the old lathe setup (left), accessories got dirty and were often mislaid. In the new one (above) the left door of the lathe cabinet can be slipped off its hinges to become a tray for tools. The inside of the right door offers a rack for accessories.

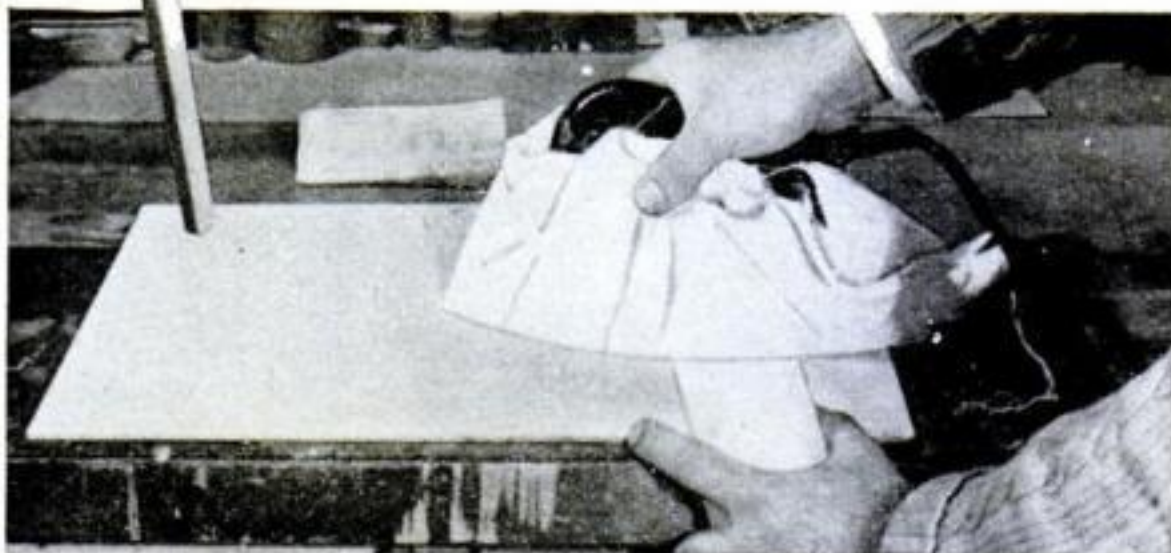
Board Wipes Clean for a New Picture



AN EASEL like this—three strips of wood secured by a machine screw at the top—will keep a youngster quietly occupied for hours. And paper is no problem—wipe the board with a cloth, and crayon drawings disappear.

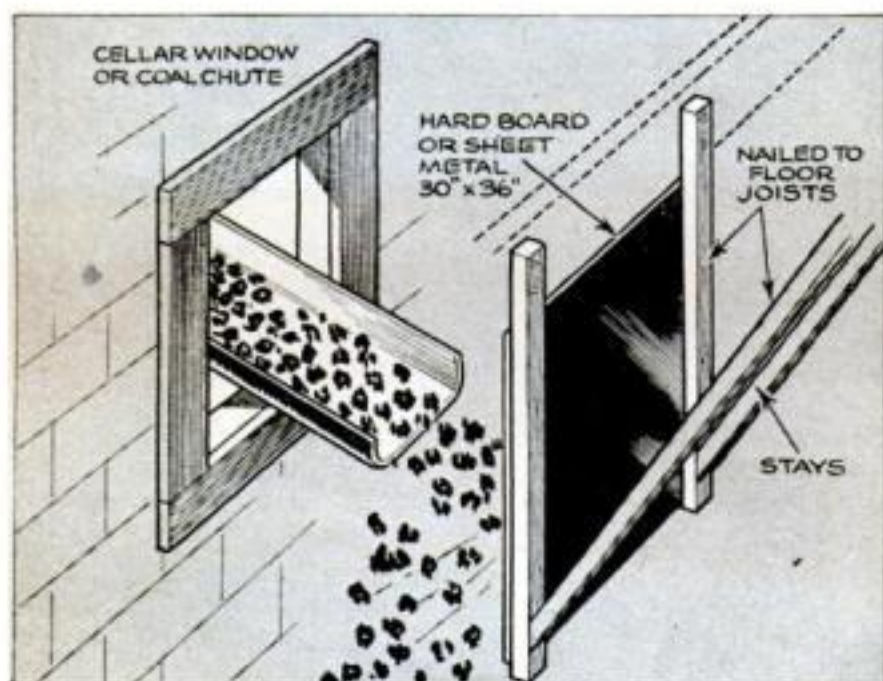
The easel legs are $\frac{3}{4}$ " by $1\frac{1}{2}$ " stock, 48" long. Trim flats on the front legs at the top so they fit flush against sides of the rear leg. Drill $\frac{1}{4}$ " blind holes in a 13" length of two-by-three, which is screwed to the front legs to form the spacer and crayon holder. Window-sash chain ties the rear leg to the spacer.

The 12" by 17" drawing board is hard-surfaced composition board, enameled white. Spread paraffin over it with a cloth-covered iron. Don't let the iron get too hot or the enamel may blister. When the wax cools, rub with a cloth until smooth and shiny. If you wish, add clips at the top to hold paper.



Deflector Stops Spilled Coal

AFTER coal has come in through a cellar window, it is usually necessary to gather up lumps that roll over the floor. A deflector like the one shown in the sketch will save work. When coal is chuted in, it will be deflected beneath the board.—Victor H. Lamoey, Upper Jay, N. Y.



Clothespin Grips Dowel

A SPRING clothespin helps when you want to clamp a small dowel in a vise. Placed between the jaws of the pin, the dowel is held rigidly at any angle for filing, cutting or drilling.—J. J. Rea, Urbana, Ill.



No-Scrape Paint Remover

LESS elbow grease may be needed to get rid of old paint and varnish with a new remover called Lazy Bill. The noninflammable liquid is brushed on and allowed to work for about 20 minutes. The softened finish is loosened by brushing with steel wool, and then floated off with water. If there are many coats to be removed, more than one application may be necessary. It is manufactured by Davies & Co., Glen Rock, N. J.

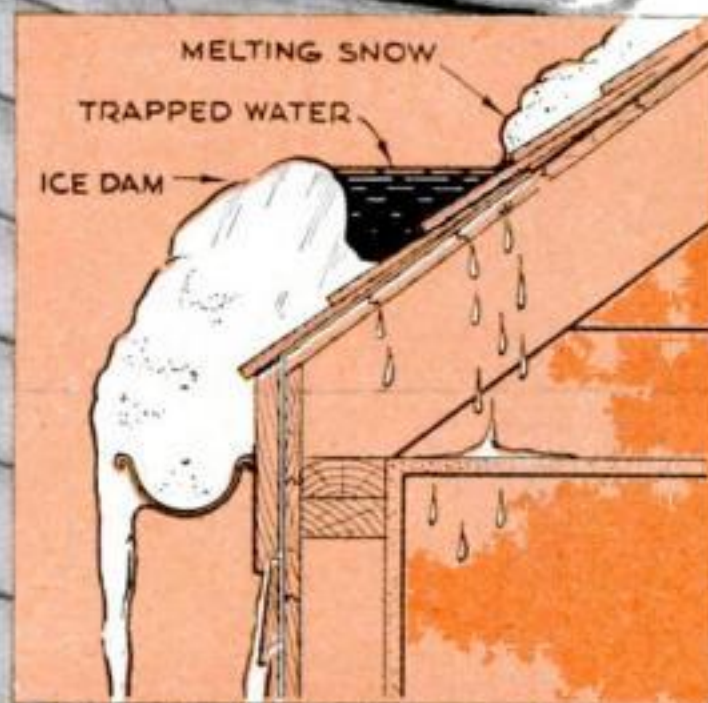
Guarding Against Roof Ice Dams

Take these precautions now to protect your home from damage this winter.

THOUSANDS of homes are damaged every winter in the northern states by ice dams—piles of ice that clog roof gutters. Water from melting snow then drips over the edge, streaking the siding—and worse yet, backs up on the roof itself. These puddles can seep through roof shingles to get inside the house and cause serious damage. You can see the stains on plaster walls and ceilings. What you can't see are the rotting timbers inside the walls.

Wide, overhanging eaves cause the most trouble. Ice often collects on the overhang because it's not warmed—as the roof is—by heat from the attic. Watch valleys, too. Backed-up water may overflow 10" flashing. There are four plans you can follow to beat this menace:

- Check your roof after a heavy snowfall. Scrape away snow 4' back from eaves, shovel out valleys.
- Use heating cable (PS, Feb. '49, p. 251) to keep gutters, downspouts and valleys ice-free.
- Lay roll roofing or flashing—if your roof sheathing isn't already covered by roofing paper—to keep water out of the house even when it backs up. You have to take up shingles for about 4' above the eaves, lay the roll roofing or flashing, and replace the shingles.
- Insulate the attic better. This stops heat from escaping through the roof and thus keeps roof snow from melting in cold weather.—*F. A. Streng, Madison, Wis.*





Ideal for beginners—Kodak Hobbyist Enlarger, only \$49.50, is offered complete with lens. New cold light protects your negatives—flashes on at the touch of a button attached to the cord. New negative carrier simplifies loading of negatives up to $2\frac{1}{4} \times 3\frac{1}{4}$ inches. Compact, light, the Hobbyist is ideal for use where space is limited.

HOW TO MAKE DARKROOM DREAMS

Ever daydream about setting up a darkroom? The Kodak equipment shown on these pages can help make those dreams come true. It's such wonderful fun to develop, print, and enlarge your own pictures . . . and quite simple, too. And the expense

need not be great. Let your Kodak dealer help start you off. Or, if you already have a darkroom, he'll be glad to suggest ways to improve it. His professional knowledge can probably save you time and money in the long run. Be sure to see him soon.

Designed for salon quality—Kodak Fluorolite Enlarger gives even, fast, high-contrast illumination with integrating-sphere light source. Focusing and elevating knobs may be used at the same time. Rotary negative carrier for easy loading. Lighttight cabinet in base for paper storage. With accessories, quickly converts to view camera for copying, cine titling, photomicrography. \$112.50 (without lens).

New Kodak Enlarging Ektanon Lens, 50 mm. $f/4.5$, for the "Fluorolite" and other enlargers. All elements are Lumenized. Iris-type diaphragm with click stops down to $f/16$. \$15.75

Other Kodak enlarging lenses for the Fluorolite range up to Kodak Enlarging Ektar Lens, 4-in. $f/4.5$, for negatives up to $2\frac{1}{4} \times 3\frac{1}{4}$. Prices from \$25.75



Kodak Masking Easel, 11x14, masks prints up to 11x14 inches, adjusts for $\frac{1}{4}$ - to $\frac{3}{4}$ -inch margins. Design assures right angles, facilitates one-hand loading. \$11.25





Time your work up to 60 minutes—Kodak Timer with tilting base. "Start-and-stop" switch permits stopping without resetting hands. \$6.75



Controls printing time to the second—Kodak Electric Time Control. Automatic, 1 to 57 seconds. Printer or enlarger plugs into control. \$13.50



Keep your hands free—Kodak Utility Footswitch leaves your hands free to handle equipment. Safe neon light glows through slots to mark location. \$10



A safelight lamp is a "must"—Popular Kodak Adjustable Safelight Lamp above is \$8.25; bracket, \$.60. (Brownie Darkroom Lamp, Model B, only \$1.15.)

COME TRUE



Dry your prints quickly, without curling—The Kodak Blotter Roll allows for free circulation of air for rapid drying. Capacity—60 prints of average size. \$2.75



Everything you need to develop and print—Kodacraft Photo-Lab Outfit includes new Kodacraft Roll-Film Tank, trays, printing frame, chemicals. \$8.50



Complete outfit, including metal printer and roll-film tank—Kodacraft Advanced Photo-Lab. Also contains everything else included in kits at left. \$13.95



For roll-film developing—Kodacraft Roll-Film Tank. After loading, can be used in lighted room. Takes 620, 120, 616, 116, and 127 films. \$2.95



For contact printing—Kodacraft Printing Frame. Includes glass plate, masks for 9 popular negative sizes. Accepts paper up to $4\frac{1}{4} \times 5\frac{1}{2}$ in. \$1.50



Takes negatives up to $4 \times 5\frac{1}{2}$ in.—Kodak Auto-Mask Printing Frame. Graduated scales on 2 sides give even margins and serve as paper guides. \$3.25



Wash film and prints in tray automatically—Kodak Automatic Tray Siphon attaches to water tap. Water is siphoned out at same speed at which it enters. \$5.25

Prices subject to change without notice and include Federal Tax where applicable.

Your Kodak dealer will be glad to demonstrate this equipment for you. See him for *all* your photo needs.

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Kodak
TRADE-MARK

Gus Gives the Air Force a Lift

[Continued from page 198]

thought to himself. "It must be a gallop that sets in only at high speeds."

The tester bore out Gus's analysis. Timing and spark were perfect at idling speeds.

"Okay, now give her the gas for a moment or two, Dale, and let's see what the tester shows. Be ready to shut her off if she starts to shake too badly."

Dale pressed the accelerator gingerly as Gus watched the tester, waiting for the vibrations to begin. But again, there wasn't the slightest sign of trouble.

"I'll be darned," said Stan.

"I'll be jiggered," echoed Silas.

"Gremlins," muttered Dale as he shut off the ignition at a signal from Gus.

Dale Gets the Third Degree

Gus said nothing. He just stood by the open hood thoughtfully. Then he walked around and looked at the starter.

"When did you say you had that new battery installed?"

"Late yesterday afternoon."

"Then what did you do?"

"Drove back here to town and had supper with Uncle Silas."

"Go out last night?"

"No," Dale replied, looking puzzled by Gus's questions.

"So the first time you used the car after driving to your uncle's with the new battery installed was this morning?"

"That's right."

"Okay, let's try her again. My hunch is that she'll vibrate again this time."

Sure enough, after Dale had started it again and began giving it the gas, the engine started to vibrate on its mounts all over again.

"Keep giving her the gas in spurts."

A Bit of Tape Turns the Trick

With the engine shuddering from side to side, Gus buried his head under the hood. Finally his head popped up into view again. "Shut her off."

Then Gus reached into the back pocket of his coveralls, pulled out a roll of tape, and began taping a section of a wire that led to the base of the distributor.

"Dale, I think your troubles are over. Start and stop her a half-dozen times or so and see if she acts up."

There was no doubt that whatever Gus had done he had fixed it. Dale stopped it,

started it, accelerated it, idled it. It ran perfectly.

"Okay, take off, young man. Happy landings. Even with 10 hours out for shut-eye and chow you've still got about 26 hours to cover that 800 miles. And don't worry about the charges." Gus winked. "I know your uncle will be glad to take care of that."

Silas Wants His Money's Worth

Young Crawford thanked Gus, shook hands all around and took off in a hurry. He didn't even stop to ask what had caused his trouble.

But not so Silas. "Now look here, Gus Wilson," he said testily after they had waved young Crawford on his way, "if I'm gonna be stuck for this job I think I oughta be told what was wrong and how you fixed it."

"Seems fair enough," said Gus, smiling. "Well, the way I see it three things added up to make Dale's car act the way it did—soft-rubber engine mounts, the fact that that particular make and model of car has a polarity inverter mounted on the starter, and most of all the carelessness of the guy who installed the new battery."

"Humph," grunted Silas. "What's all that mean? And what in tarnation is a polarity inverter?"

"It's a gimmick like an automatic reversing switch. It reverses the flow of six-volt current to the distributor each time the starter works, so that the breaker points don't burn and pit quite so quickly."

Bare Wire Gets Pinched

"Oh. But how could that make an engine prance around like Dale's did?"

"It didn't, but it did account for the fact that the engine would run smoothly one time and not the next. What really caused the trouble was a chafed spot in the insulation on a low-voltage wire leading to the distributor."

"What chafed it?" Silas inquired, peering at Gus over his glasses.

"Well, that wire runs right up beside the battery, and unless I miss my guess the jerk who installed that battery pinched the wire between the battery and the metal battery case when he tightened the hold-down clamps. Then, to save time, he just yanked the wire loose, ripping off a hunk of the insulation."

[Continued on page 244]



PATENTED
CORALOX
INSULATOR

Engineered for and with your CHEVROLET...

While Chevrolet engineers were perfecting your Chevrolet engine, AC Spark Plugs were developed *with* it, and especially *for* it.

No other make of spark plug can offer Chevrolet owners this great engineering advantage.

AC's patented CORALOX Insulator made today's AC Chevrolet Spark Plugs possible. Physical properties never before equaled permitted better insulator shapes—provided better heat conduction—better electrical insulation—surer firing throughout the entire heat range of the engine.

There is a correct AC Spark Plug type for every Chevrolet model, carefully engineered to give you the performance approved by Chevrolet engineers.



IF YOUR CAR ISN'T A CHEVROLET you, too, can have the superior performance ensured by CORALOX. AC's engineering staff has worked with engineers of most American cars. Therefore, there is an AC Spark Plug type, with patented CORALOX Insulator, engineered for your engine.



AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

NOVEMBER 1951 243



- 1 **Wood Rasp** — Flat type; bastard cut, for fast stock removal.
- 2 **Cabinet Rasp** — Half Round type; smaller degree of coarseness.
- 3 **Wood File** — Flat type (also made in Half Round), mainly for finishing.

FOR wood fix-ups

Mr. Fixerupper is again setting up business in the home basement, garage or tool shed. Repairing and restoring old, and building new, furniture and cabinets can be both a hobby and practical household economics.

Good wood shaping, fitting and finishing results can be obtained with a modest selection of files. Such a selection is also a thoughtful contribution toward the conservation of steel which is so important to the nation just now.

Buying *good* files—Nicholson or Black Diamond, for instance—also helps. Because they last long, they ultimately use up less steel than poorly made, short-lived files. Good hardware stores carry Nicholson brands—and will gladly help you pick out a non-wasteful assortment for your particular needs.

HOW TO USE AND TAKE CARE OF FILES — to make them last long — is worth knowing. "*File Philosophy*," Nicholson's famous 48-page book, tells you. **FREE** — send for it today.



NICHOLSON FILE COMPANY
19 Acorn Street, Providence 1, R. I.
(In Canada, Port Hope, Ont.)



NICHOLSON FILES

FOR EVERY PURPOSE

Gus Gives the Air Force a Lift

[Continued from page 242]

Gus went on to explain how when the engine was idling everything was fine, but when it was speeded up the initial torque tilted the engine just enough on its rubber mounts to bring the bare wire in contact with the metal battery holder. That would short out the distributor, the engine would sputter, lose torque, return to its normal position, break the short and pick up again. Then the whole cycle would repeat itself, causing the engine to rock violently.

"Well, where does this here polarity reverser or whatever it is come in?" Silas wanted to know.

Gus Makes Everything Clear

"Here, I'll show you." Gus drew a couple of rough diagrams on a scrap of paper. "What I just described only happened on every other start when the polarity inverting switch was in the position that made the wire with the bare spot the positive and live lead to the distributor.

"Naturally, when the switch made the wire the ground wire, the car ran okay even when the bare spot touched the battery holder. You can't short out a grounded wire."

"Now, about that damaged wire," said Silas, with a crafty gleam in his eye, "suppose you could prove the battery people caused all this trouble?"

"Sorry, Silas, but I'm not conniving with you in any schemes to get a rebate. Uh-uh. You bargained for a bargain and you got stuck with it."

Silas Gets a Bargain at Last

"How much you gonna soak the old tightwad?" asked Stan when Barnstable, grumbling as usual, had left.

"Oh, just the usual labor charge plus a tow. That ought to add up to enough to give young Crawford a nice Saturday night off the base."

"You mean you're going to send the money to him?"

"You guessed it," said Gus. "It'll be Silas' first contribution to the Armed Forces. I'll tell Crawford it was worth it to me to teach the old nickel-nurser a lesson." Gus grinned. "And for once Silas will really be getting his money's worth . . . Is there any better bargain today than American freedom?" **END**

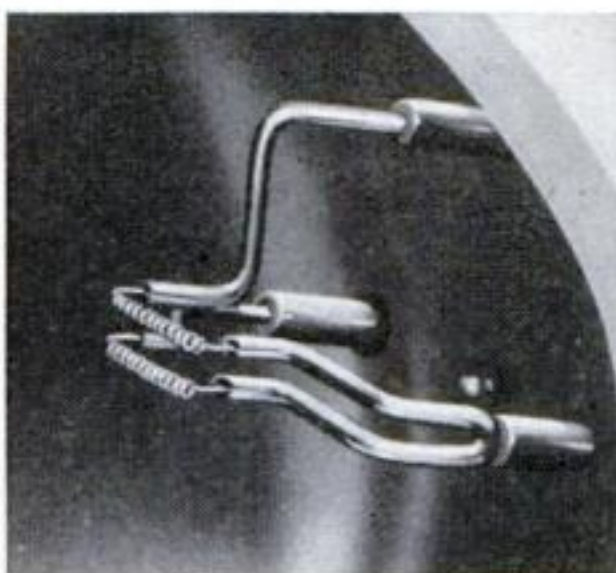
Next month: Gus gets the Christmas trees through.

THIS IS
A G-E
"ALL-GLASS"
HEADLAMP

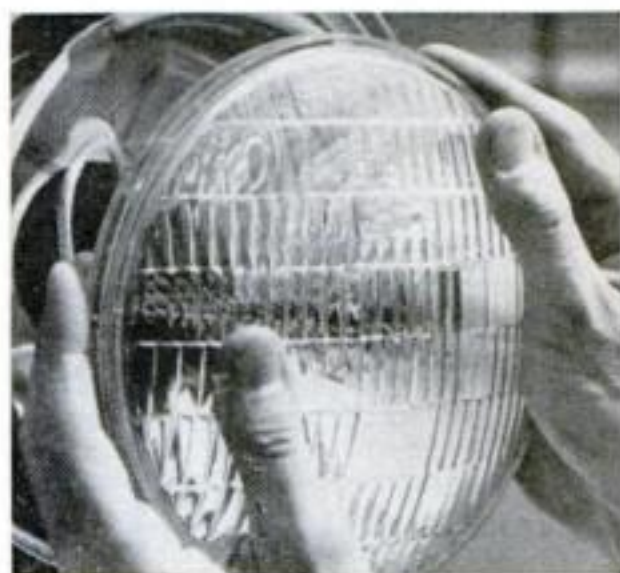
THIS CUTAWAY
SHOWS WHY
A G-E
HEADLAMP
DOES NOT
GROW DIM!



1. RUGGED, ONE-PIECE construction keeps dirt and moisture from getting in to steal the light. General Electric headlamps average 99% of original light output at end of life.



2. IMPROVED FILAMENTS give 12% more light on the road for driving—16% more light for passing. They're firmly anchored so they won't shake loose on bumpy roads.



3. HARD-GLASS LENS resists shock—is precision-built to throw maximum light on the road. Have lights checked next time your car is serviced—and insist on G-E lamps for replacement.

You can put your confidence in—

GENERAL  **ELECTRIC**



WHAT D'YA KNOW
...that muck in my car?

A mucked-up oil filter can cost you plenty in engine repairs. Get in a new Purolator* Refill—quick!

Checked your oil filter lately? Chances are it looks like this . . . is so clogged up it can't trap all the engine-wrecking abrasives that seep into your oil. Your car may be headed for some costly repairs.

What to do? Don't delay—get in a clean filter refill—fast. **Which make?** Pays to buy the best—a Purolator Micronic*. New accordion-type design gives up to 10 times the filtering area—with pores so tiny they trap particles you can't even see. **Cost much?** Strictly small change—\$1.38 to \$3.00 depending on car make. Purolator Products, Inc., Rahway, N. J.; Toronto, Ontario, Canada.

*Reg. U. S. Pat. Off.



PurOlator
MICRONIC
OIL FILTER



Right you are—it's **JACK CARSON**,
now starring in "MR. UNIVERSE"

New Poison Fools Rats [Continued from page 204]

rats that the manufacturer restricts its sale to professional exterminators and government agents.

Besides using warfarin and other poisons, a man ridding a place of rats must follow principles of sanitation (keep garbage in a closed can, pick up piles of lumber in yard, etc.), and must ratproof his buildings. He can also trap rats. These steps keep rats from food and shelter.

Rats Destroy Each Other

Deprived of shelter, rats will migrate and fight and kill each other. Deprived of food, they will fight, kill, and eat each other; they will starve, and perhaps die; they will be forced to take poisoned bait more quickly and in greater quantity.

It is possible, according to Dr. Harold Gunderson, of Iowa State College, to tell how bad a particular rat problem is. If you see gnawed food, torn sacks, or the long, dark streaks across a floor that indicate a rat runway—but never see a rat—chances are there are from one to 100 rats around.

They Multiply Like Rabbits

If you see a rat occasionally at night, there are probably 100 to 500. If you see rats each night and sometimes by day, there are probably 500 to 1,000 in the vicinity. If you see many at night and several every day, there are likely to be 1,000 to 5,000 on hand.

No matter how big a rat problem a man has, he now has a chance to lick it and keep it licked. The rat's natural enemies—cats, dogs, owls, hawks, skunks, snakes, mongooses and ferrets—have never been able to stop the increase of rats because the rats multiply too fast. Sexually mature before they are grown, they have six to eight litters a year with six to 14 in each litter. That is why we have more than 155,000,000 rats in the U. S. END

Water Flea Used as "Guinea Pig"

THOSE tiny water fleas, nymphs, and larvae that abound in rivers and streams are now being used as "guinea pigs" to determine the polluting effects of industrial wastes on fish life. Dr. Charles E. Renn of Johns Hopkins University studies the effects of various poisons on the tiny animals, which are the food on which fish live.



"ZERONE"*
(TYPE S)
The \$1⁵⁰† brand
in most demand

One shot of
DuPont "ZEREX"*
(TYPE P)
lasts all winter—
\$3⁷⁵† a gallon.



GET A DU PONT ANTI-FREEZE NOW

... but before you put in anti-freeze, have
your cooling system checked and serviced



Go to an expert. The dealer who displays
this emblem offers you a *special* winter
service. Make a date with him early for
anti-freeze and for a thorough cooling sys-
tem check-up before the anti-freeze rush
jams his driveway.

*Reg. U. S. Pat. Off.
†O.P.S. Retail Ceiling Price



BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

I CAN MAKE
BIG MONEY

AT HOME OR
HAVE FUN USING
MY NEW SAFE
SYNCRO JIG SAW
... BETTER GET
YOURS!



**LARGEST AND
MOST POWERFUL
SAW of its kind!**

**NOW CUTS 1" WOOD
THIN METAL, PLASTIC,
QUIET OPERATION!**

SYNCRO POWER UNITS
GUARANTEED
AGAINST BURN-OUT DURING
YOUR OWNERSHIP OR
REPLACED FREE!



No. 201



**ONLY
\$22.95
MOTOR
INCLUDED**

You, too, can use this amazing new, safe jig saw for fun or profit! Make your own Gifts or to sell! SYNCRO SAW is the most powerful, largest of its kind! QUIET, ideal for apartments. SAFE, blade does NOT pull fingers toward it. NO belts, gears or oiling. Adjustable "any length cut" arm. With BUILT-IN New Reactance Type Electric Motor. \$22.95 at dealers or postpaid. World's largest manufacturer of reciprocating electric sanders with double arc motion which gives double the sanding action.

SYNCRO **ELECTRIC
JIG SAW**
QUALITY TOOLS U.S.A. Model No.
201. 60 Cycle, 110-
120 Volt AC. Other Voltages, Cycles available.

USE COUPON FOR CIRCULAR OR DIRECT ORDER

SYNCRO CORP., Dept. G-111, Oxford, Michigan, U.S.A.



- ☐ **ORDER.** I enclose \$22.95. Send No. 201 Saw postpaid on 10-Day Money Back Trial.
- ☐ **FREE CIRCULAR.** Send new SYNCRO CIRCULAR showing amazing new SAW and amazing NEW SANDER.

WRITE NAME, ADDRESS BELOW — MAIL TODAY!

248 POPULAR SCIENCE

Portable Machines Build Houses Fast

[Continued from page 139]

no longer need four or five men and a stout tree trunk. A Greenlee pipe bender does the job. It is powered hydraulically through a gasoline motor or a hand-operated pump.

The ½-inch electric drill, equipped with a wood auger, a pipe bit, or a hole saw, bores the pipe-holes for plumbing or conduits. An automatic machine threads the pipe. An electric stapler fastens building paper to studs. The electric shaper cuts moldings. The electric plane trims doors and windows to exact dimensions. A routing jig places hardware on doors.

New Tools Constantly Appear

Power helps finish the 1951 house, too. Sanders rough- and smooth-finish almost everything—floors, concrete, wallboard, trim, cabinets, plastics, plywood, masonry, plaster—10 times faster than by hand. Some sanders weigh five pounds and can be operated with one hand. Some will work on flat, curved, vertical, horizontal or overhead surfaces. The floor edger finishes corners, stairs and closets that the floor sander can't reach. The ½-inch electric drill or the electric hammer drills masonry—to fasten fuse boxes, anchor furring and install awnings. The tuck pointer cleans up joints in new masonry. The handyman's ¼-inch electric drill and his 5-inch sander-polisher help on shelving, cupboards, counters. The paint sprayer finishes off the decorating.

New power tools for home building are constantly appearing. The plaster pump sprays plaster from a hopper onto a wall or straight up onto the ceiling.

A really different tool is the cartridge-powered stud driver (PS, Aug. '51, p. 143). It uses a .32-caliber cartridge to shoot a file-hard steel stud into almost any kind of structural material, even steel and concrete.

Rented Tools Save Owner Money

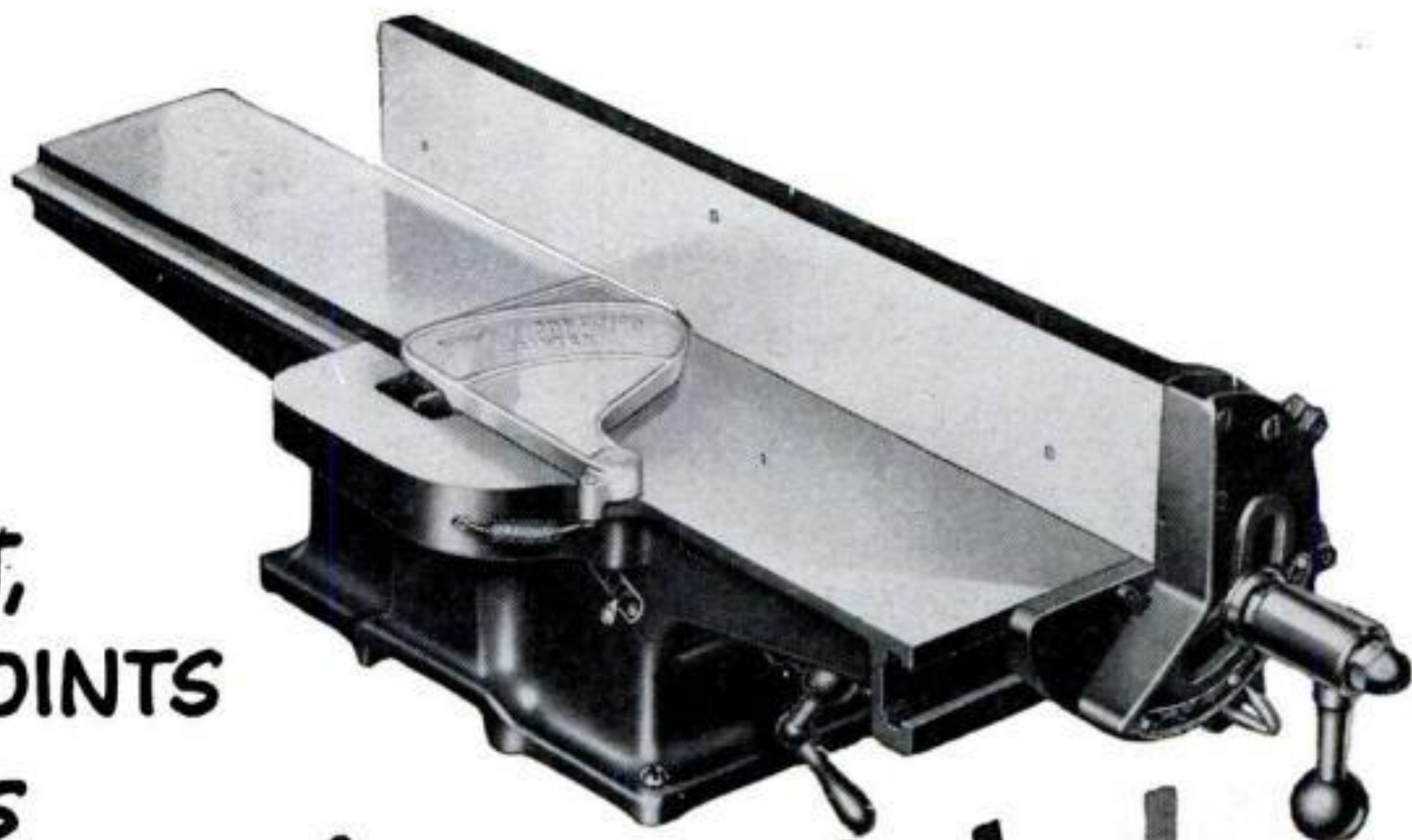
The present building boom and the high cost of labor have both helped spark the power-tool revolution. And something else fundamental is happening to spread the revolution: through lumberyards, hardware stores and paint stores you can rent the tools for a few hours, for a few days or for a whole house-building job.

Speed, availability, work saving—all these characteristics of power tools make it possible for the owner himself to do more work than ever upon a new home.

END

**PLANE
TRUE,
STRAIGHT,
SQUARE JOINTS
WITH THIS**

DELTA 4-inch Jointer



- ☆ *Adjustable front and rear tables*
- ☆ *ONE control to slide and tilt fence*

You can do real quality joining speedily, easily and safely with this remarkable tool—the finest ever offered for home workshops.

Check over these excellent practical features that mean more accuracy and greater satisfaction with the Delta 4-inch Jointer.

- it's a big, husky machine
- three knives are held in a specially balanced revolving head which runs on lubricated-for-life ball bearings
- knives are precision-ground to match and balance
- fence is rigid and heavy—no deflection; can be moved entire width of table
- fence tilts 45° in either direction—automatic, stops at 45°, 90° and 135° from table
- tables are finish-ground to assure perfect line-up, and are individually adjustable
- super-safe guard covers knives
- tables raise and lower on V-ways, with adjustable gibs to take up for wear.

See this fine Delta Tool at your nearest Delta dealer; and send for the valuable free book "How to Start Your Homeshop"—scores of pictures, ideas, helpful suggestions. Use the coupon.

There's a Delta Tool for Your Job—
WOOD OR METAL WORKING

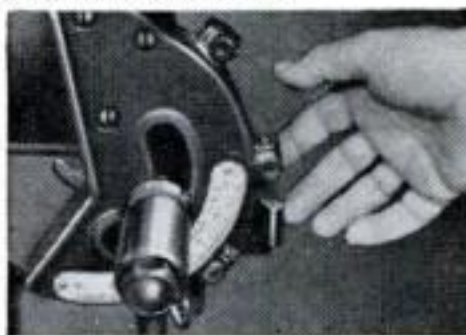
**53 MACHINES 246 MODELS
MORE THAN 1300 ACCESSORIES**



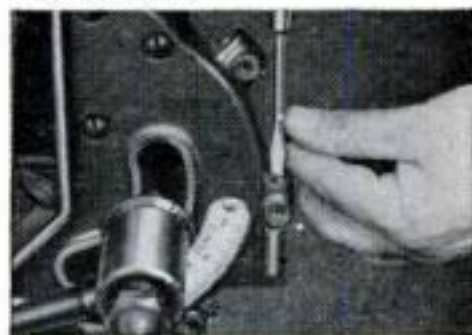
☆ Dual control handle sets and securely locks fence in any position across table



☆ Dual control handle tilts fence and securely locks it to any angle desired



☆ Automatic stops set at 45°, 90° and 135°; large scale for accurate settings



☆ Stop screws individually adjustable for absolute accuracy; fence will always automatically stop at setting.

**DELTA
MILWAUKEE**



DELTA POWER TOOL DIVISION

Rockwell

MANUFACTURING COMPANY

805M E. VIENNA AVENUE • MILWAUKEE 1, WIS.

- ☐ Please send me the "How to Start Your Homeshop" book.
- ☐ Please send me the name and address of the nearest Delta dealer.

Name _____

Address _____

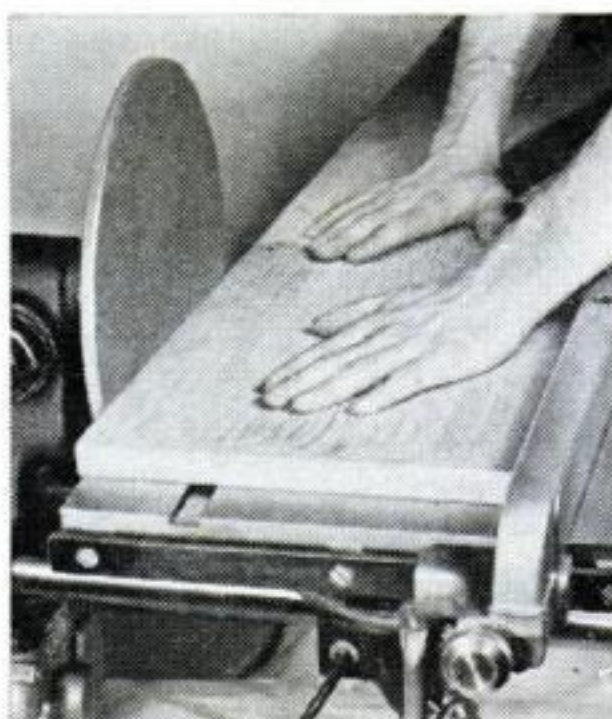
City _____ Zone _____ State _____



"JOB #1 SOLD ME



1 "Big-job capacity. I don't know of any other 8-inch saw that matches the capacity of SHOPSMITH. The table extension gives you a working area 17" x 54". Sawing long boards and 4' x 8' plywood panels is a one-man job."



2 "Smoothing edges with the disc sander is a SHOPSMITH exclusive. It's done by setting the rip fence at a slight angle to the disc. Work fed between fence and disc is jointed to precise widths. The big, tilting table gives plenty of support."



3 "Perfect doweling is possible with SHOPSMITH in the horizontal drill press position. Work is laid flat on the table and backed up by the rip fence. Drill is fed in from the side. Ball and crank table-raiser accurately adjusts table height."

See SHOPSMITH demonstrated at leading hardware and department stores or any Montgomery Ward store. **FREE!** 16-page information-packed catalog. Gives details and specifications on SHOPSMITH and accessories. Write for it.

Basic SHOPSMITH includes all attachments for . . .

8" circular saw • 15" drill press
12" disc sander • Horizontal drill
33" wood lathe

5-tool unit complete except for motor* **\$189⁵⁰**

*Special 1/2-hp., capacitor-type motor, \$34.50

ON SHOPSMITH!"

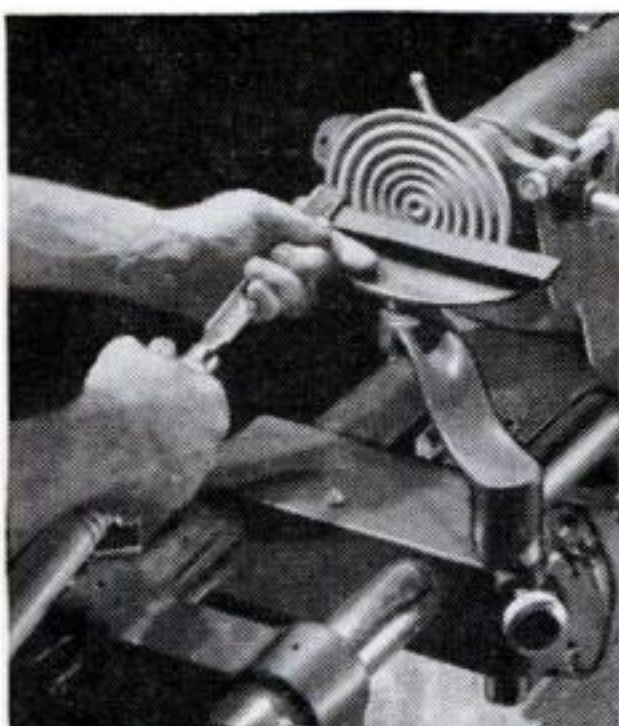


"A built-in wardrobe cabinet was my first real SHOPSMITH project. And what an eye-opener it was! I never realized that SHOPSMITH could do so much in so many different ways in such limited space.

"I like the way SHOPSMITH converts quickly and easily from saw to disc sander to wood lathe to horizontal and vertical drill press. I like the way it's made—four ball bearings, heavy castings, precision-fitted parts. Best of all, I like its

flexibility and the fact that, in each of its five positions, it has features you won't find in any other power tools. Simplified micro-adjustments and convenient, ready-to-use jigs, for example.

"In making the cabinet, I found that no job was too big, too difficult, or too unusual for my SHOPSMITH. Being able to use the right tool the right way saved me hours of time. And the accuracy I got was mighty satisfying. It was a big job, but SHOPSMITH made it easy!"



4 "Face to face. SHOPSMITH is the only lathe that lets you face your work while turning knobs, bowls or other flat or hollow objects. The full-swivel tool rest makes it easy to get into and behind faceplate turnings. Lathe has 15" swing, 33" capacity."



5 "Tall trimming. I needed to trim 3" off the side of the doors for the wardrobe. So I set SHOPSMITH in the vertical saw position and used the floor as a fence guide. It was a lot faster than hand sawing—and far more accurate."



6 "Built-in jig. When it came to drilling dowels for the drawer pulls, SHOPSMITH again showed its flexibility. The fence and tilting table formed a V-block for holding the dowel accurately. SHOPSMITH as a drill press is second to none!"



MAGNA ENGINEERING CORPORATION
Dept. 186-A
at factory nearest you:
12819 Coit Road, Cleveland 8, Ohio, OR
Menlo Park, California

Please send me free 16-page SHOPSMITH catalog.

Name _____

Address _____

City _____ State _____

YOU CAN TELL A GOOD ELECTRIC DRILL BY ITS CHUCK



JACOBS

If it's a JACOBS
It bears the name...look for it!

Jacobs Rubber-Flex Hex-Key Chucks on home workshop power tools prove that their makers put quality first.

Jacobs Plain Bearing Key Chucks... the most widely used drill chuck in the world.



Jacobs Rubber-Flex Hand-Tite Chuck. One-piece RUBBER-FLEX jaw assembly holds tools true and tight. No loose jaws or springs.

IF IT'S A
JACOBS

IT HOLDS

The Jacobs Manufacturing Company
West Hartford 10, Connecticut

Why Our Winters Are Getting Warmer [Continued from page 117]

are also rhythmically occurring periods that fall at varying intervals—for example, every nine, 18, or 36 years. These correspond to other tidal cycles. They produce climatic variations of shorter periods and of less drastic nature.

Fish Failed and Ships Sank

The year 1903, for instance, was memorable for its outbursts of polar ice in the Arctic and for the repercussions on Scandinavian fisheries. There was "a general failure of cod, herring and other fish along the coast from Finmarken and Lofoten to the Skagerrak and Kattegat. The greater part of the Barents Sea was covered with pack ice up to May, the ice border approaching closer to the Murman and Finmarken coasts than ever before. Herds of arctic seals visited these coasts, and some species of the arctic whitefish extended their migrations to the Christiana Fiord and even entered into the Baltic."

This outbreak of ice came in the year when earth, moon and sun were in a relative position that gives a secondary maximum of the tide-producing forces. The similar constellation of 1912 was another great ice year in the Labrador Current—a year that brought the disaster of the *Titanic*.

Now in our own lifetime we are witnessing a startling alteration of climate, and it is intriguing to apply Otto Pettersson's ideas as a possible explanation.

It is now established beyond question that a definite change in the arctic climate set in about 1900, that it became astonishingly marked about 1930, and that it is now spreading into subarctic and temperate regions. The frigid top of the world is very clearly warming up.

Ships Sail Farther North

The trend toward a milder climate in the Arctic is perhaps most strikingly apparent in the greater ease of navigation in the North Atlantic and the Arctic Sea. In 1932, for example, the *Knipowitsch* sailed around Franz Josef Land for the first time in the history of arctic voyaging. And three years later the Russian ice-breaker *Sadko* went from the northern tip of Novaya Zemlya (Northern Land) to 82°41' north latitude—the northernmost point ever reached by a ship under its own power.

[Continued on page 254]

See, Try, and Compare Westcraft Tools... Discover How Little Fine Tools Can Cost!



Join the thousands who have discovered that famous, professional quality Westcraft tools give you the same precision engineering and lasting accuracy of other brands costing con-

siderably more. Before you buy **any** tools, see how much more you get by shopping the complete line of guaranteed Westcraft tools . . . yours on easy terms at Western Auto!

(1) **Tilt Table Jig Saw**, cuts to center of 24" circle. Scotch yoke, oilite bearings. Uses 5" pin or plain end blade..... (2J1102) **\$20⁸⁰**

(2) **17-pc. Socket Set**, 1/2" Sq. Drive. Alloy steel chrome plated. 12 sockets, reversible ratchet, 5 fittings..... (HR2951) **\$19⁴⁵**

(3) **Hacksaw**, chrome-plated adjustable steel frame. Cuts 3 3/8" deep. Safety grip plastic handle with 10" blade..... (4HR4159) **\$2²⁵**



8-Point Crosscut Saw, 26", 4-gauge double tapered blade. Precision tempered... (4HR6329) **\$4⁷⁹**



Screwdriver, alloy steel, chrome-plated, 4" square blade. Positive-grip handle..... (HR1361) **89¢**



7" Lobster Claw Plier. Patented design gives 50% more gripping power..... (HR1125) **\$1²⁹**



Claw Hammer, 16-oz. Full polished. Tempered claws and head. Hickory handle (4HR6125) **\$3¹⁵**

Professional Quality—Wizards of Performance

WESTCRAFT TOOLS

Sold by the largest group of associated tool departments in America.

WESTERN AUTO
STORES & ASSOCIATE STORES

Sold
Only By

NOTE: Western Auto Associate Dealers own their own stores and set their own prices. Terms quoted are recommended terms, subject to variance. ©1951 Western Auto Supply Co., K. C., Mo. (PS-111)

TREAT YOURSELF TO THIS HACKSAW COMBINATION

Blades and Frames Precision
Made by **Starrett**



The fastest, easiest cutting hacksaw blade... in the sweetest, smoothest-swinging pistol grip hacksaw frame. Both made by *Starrett*—World's Greatest Toolmakers... to save your time, temper and muscle. Get the best... ask for Starrett Hacksaw Blades and Frames at your tool dealer or industrial distributor.

BUY **Starrett** BAND SAW BLADES For Cutting Metal, Wood, Plastics

Hard-edge, flexible-back, spring temper or "Skip-Tooth" types. Cut to length and welded or as coil stock in handy reel dispenser.

LOOK FOR THE **STARRETT** HACKSAW DISPLAY

Buy where you see this display... the right blade and frame for easy, effortless cutting.



THE L. S. STARRETT COMPANY • ATHOL, MASS., U.S.A.



BUY THROUGH YOUR DISTRIBUTOR MECHANICS' HAND MEASURING
TOOLS AND PRECISION INSTRUMENTS • DIAL INDICATORS • STEEL TAPES • PRECISION
GROUND FLAT STOCK • HACKSAWS, BAND SAWS and BAND KNIVES

Why Our Winters Are Getting Warmer [Continued from page 252]

In 1940 the whole northern coast of Europe and Asia was remarkably free from ice during the summer months, and more than 100 vessels engaged in trade via the arctic routes. In 1942 a vessel unloaded supplies at the west Greenland port of Upernivik (latitude 72°43'N) during Christmas week "in almost complete winter darkness." During the Forties the season for shipping coal from West Spitsbergen ports lengthened to seven months, compared with three at the beginning of the century. The season when pack ice lies about Iceland became shorter by about two months than it was a century ago. Drift ice in the Russian sector of the Arctic Sea decreased by a million square kilometers between 1924 and 1944, and in the Laptev Sea two islands of fossil ice melted away completely, their position being marked by submarine shoals.

Birds and Fish Move Poleward

Activities in the nonhuman world also reflect the warming of the Arctic—the changed habits and migrations of many fishes, birds, land mammals and whales.

Many new birds are appearing in far northern lands for the first time in our records. Some high-arctic forms, which thrive in cold climates, have shown their distaste for the warmer temperatures by visiting Greenland in decreasing numbers.

As the chill of the northern waters has abated and the fish have moved poleward, the fisheries around Iceland have expanded enormously, and it has become profitable for trawlers to push on to Bear Island, Spitsbergen and the Barents Sea. These waters now yield perhaps two billion pounds of cod a year—the largest catch of a single species by any fishery in the world. But its existence is tenuous. If the cycle turns, the waters begin to chill, and the ice floes creep southward again, there is nothing man can do that will preserve the Arctic fisheries.

Glaciers Are Receding

The recession of the northern glaciers is going at such a rate that many smaller ones have already disappeared. If the present rate of melting continues others will soon follow them.

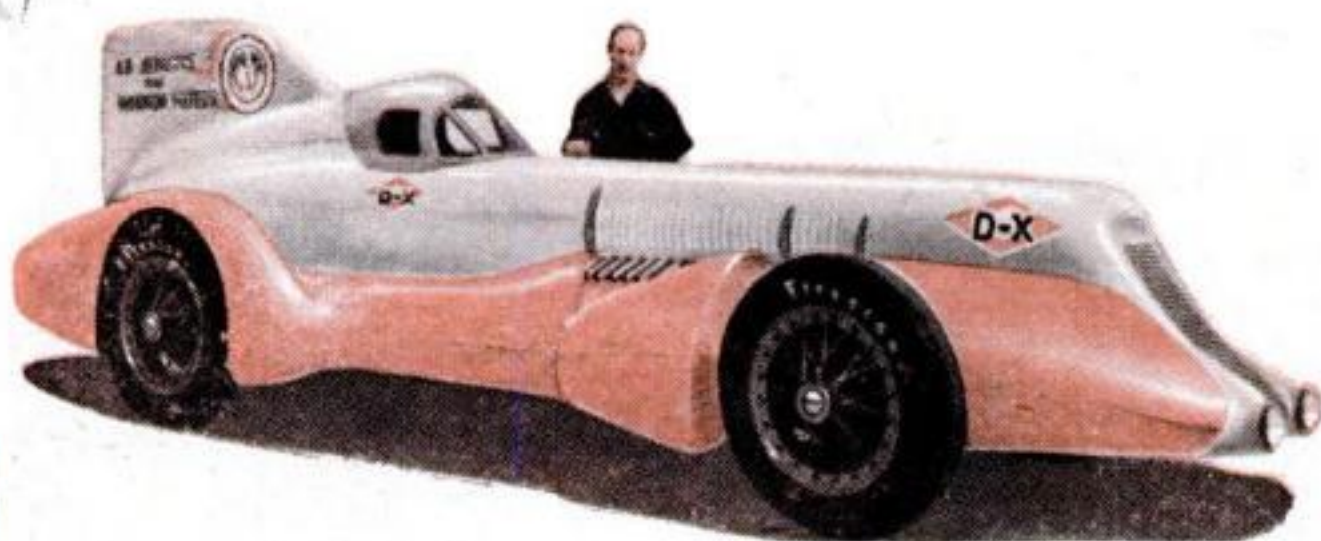
The melting away of the snow fields in the Opdal Mountains in Norway has exposed wooden-shafted arrows of a type used about

[Continued on page 256]



WORLD'S SPEED KING Tells Why He Recommends **Champion Spark Plugs** *for Every Engine!*

AB JENKINS,
*World's Speed King and former
Mayor of Salt Lake City, Utah*



As the holder of more World and American speed records than any other man, I believe I can speak with authority on spark plugs. In over 30 years of racing against the clock you acquire a lot of practical knowledge about the equipment that will give you top performance and dependability. At 200 miles per hour my spark plugs take more of a beating in an hour than the spark plugs in your car do in over a year's normal driving. From my own experience Champion Spark Plugs have no equal and I've tested them all. I hold hundreds of American and World speed records and just recently added 24 new ones, all made with Champions. I unqualifiedly recommend Champion Spark Plugs.

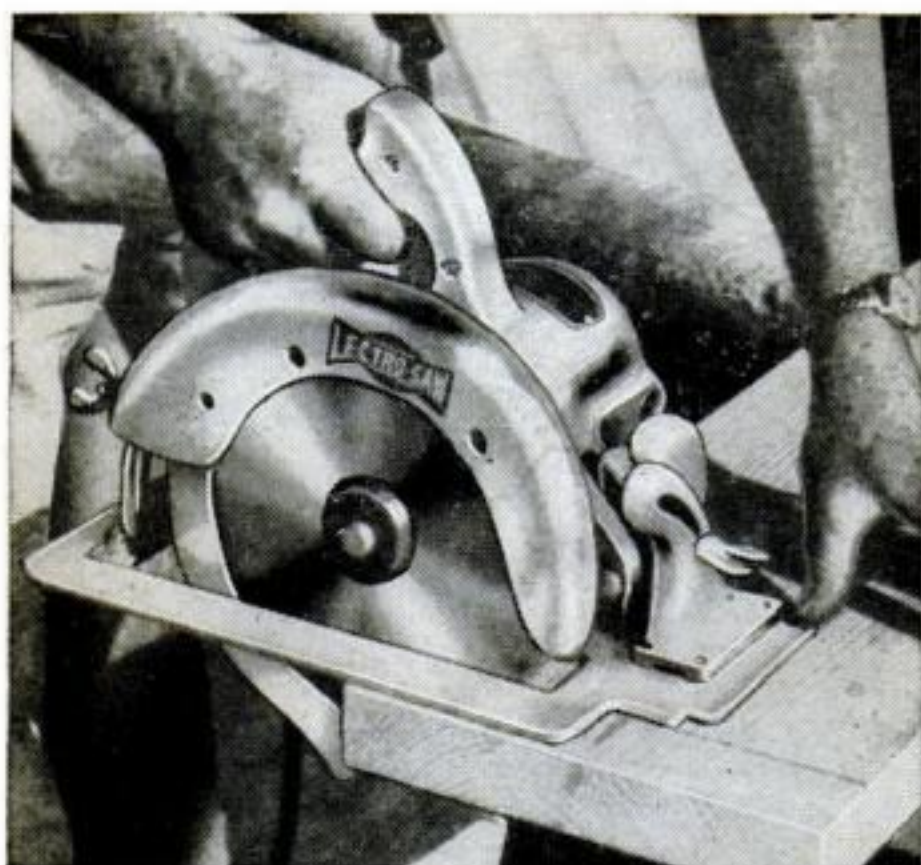
Ab Jenkins

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

FOLLOW THE EXPERTS
**DEMAND DEPENDABLE
CHAMPIONS
FOR YOUR CAR**

The Sign of Dependable Service!





Lectro-Saws are Professional Saws at Popular Prices

10 times faster than hand sawing!

BLACK & DECKER LECTRO-SAWS save you so much time, money and materials that they pay for themselves in a few jobs—and go on giving you extra-long years of usefulness because of the real quality Black & Decker builds into them... dependable motor, full-size ball bearings, high-quality helical gearing, hardened armature shaft, husky housings! Just look at their *professional* features listed below—check those *low prices*—then go try one at your hardware, electrical or building supply dealer!

ABUNDANT POWER! Motors built by Black & Decker specifically for tough power sawing.

EASY HANDLING! Handle-to-blade dimension held to minimum for easy control; handle close to center of gravity for good balance.

FAST ADJUSTMENT! Depth and bevel of cut easy to change; dual depth adjustments keep wrist position comfortable at any depth cut.

FULLY SAFEGUARDED! Telescoping blade guard. Instant release trigger switch. Correctly positioned saw-grip handle.

LOW PRICES! 8" Heavy-Duty, cuts to $2\frac{13}{16}$ " depth, \$92.50; 6" Deluxe Heavy-Duty, cuts to 2" depth, \$76.50; 6" Heavy-Duty, cuts to 2" depth, \$56.50.

BLACK & DECKER



THE BLACK & DECKER MFG. CO.,
Dept. H11S, Towson 4, Md.

Why Our Winters Are Getting Warmer

[Continued from page 254]

A D. 400 to 500. This suggests that the snow cover in this region must now be less than it has been at any time within the past 1,400 to 1,500 years.

The glaciologist Hans Ahlmann reports that most Norwegian glaciers "are living only on their own mass without receiving any annual fresh supply of snow"; that in the Alps there has been a general retreat and shrinkage of glaciers during the last decades, which became "catastrophic" in the summer of 1947, and that all glaciers around the North Atlantic coasts are shrinking. The most rapid recession of all is occurring in Alaska, where the Muir Glacier receded about $10\frac{1}{2}$ kilometers in 12 years.

The milder arctic and subarctic climate seems already to have resulted in longer growing seasons and better crops. The cultivation of oats has improved in Iceland. In Norway good seed years are now the rule rather than the exception, and even in northern Scandinavia the trees have spread rapidly above their former timber lines, and both pine and spruce are making a quicker annual growth than they have for some time.

The World Is Warming Up

The countries where the most striking changes are taking place are those whose climate is most directly under the control of the North Atlantic currents. Greenland, Iceland, Spitsbergen and all of northern Europe, as we have seen, experience heat and cold, drought and flood in accordance with the varying strength and warmth of the eastward- and northward-moving currents of the Atlantic.

It is interesting to calculate where our twentieth-century situation fits into the cosmic scheme of the shifting cycles of the tides. The great tides at the close of the Middle Ages, with their accompanying snow and ice, furious winds and inundating floods, are more than five centuries behind us. The era of weakest tidal movements, with a climate as benign as that of the early Middle Ages, is about four centuries ahead. We have therefore begun to move strongly into a period of warmer, milder weather. There will be fluctuations, as earth and sun and moon move through space and the tidal power waxes and wanes. But the long trend is toward a warmer earth; the pendulum is swinging.

END



A KENTILE FLOOR COSTS SO LITTLE when you install it yourself!..



ONLY \$19⁹⁵*
FOR A 9'x11'
KENTILE FLOOR

and you get *lasting* beauty
at this low price!

KENTILE

GUARANTEE FOR SELF-INSTALLED KENTILE

Kentile, Inc. will provide new tile without charge for any Kentile that wears out... and on which colors wear off... during your own occupancy of your home wherein you have installed Kentile. This guarantee does not apply to damage caused by improper handling, or failure to follow the instructions for installation and maintenance available at your Kentile dealer's.

Why buy floor coverings with just a colored surface that soon wears off? It costs so little more to get wear-resistant KENTILE with colors that go all the way through the tile and backed by this GUARANTEE!

GUARANTEED KENTILE IS SO EASY TO INSTALL

TILE by tile installation is quick, fun. And your Kentile Floor lasts for years... sheds dirt... resists stains and scuffs... sparkles like new with an occasional no-rub waxing.

Only your Kentile Dealer has low-cost, guaranteed Kentile Floors... the Ken-Kit with the tools you need. Get an estimate... look in your classified phone

book under FLOORS... in Canada at T. Eaton Co., Ltd.

FREE BOOKLETS. Send for a copy of the Kentile Self-Installation Folder and the Kentile Color Line. You'll see how easy it is to install your own Kentile Floor in your choice of the 26 modern colors. Kentile Inc., Dept. H-4, 58 2nd Avenue, Brooklyn 15, N. Y.

*Price quoted is for a 9'x11' Kentile Floor installed by you. Price may be lower or slightly higher depending on size of room, colors chosen and freight rates.



KENTILE.

The Asphalt Tile of
Enduring Beauty



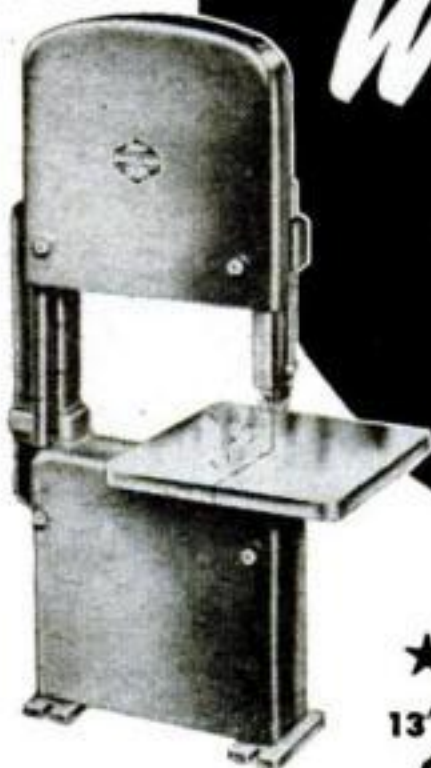
NOVEMBER 1951 257

LOOK!

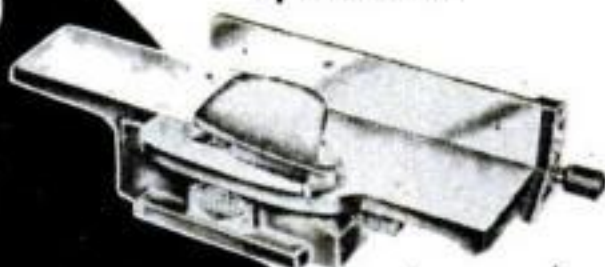
★ **NEW** 8" BENCH SAW
\$33.95



★ **NEW** 10"
BAND SAW
\$42.50



★ **NEW** 4" JOINTER
\$28.75



★ **NEW**
1 1/4" DRILL PRESS
\$37.50



*These 5 Atlas
Workshop Tools
FOR ONLY
\$161.20*

★ **NEW**
13" JIG SAW
\$18.50



ALL PRICES LESS MOTOR
F.O.B. KALAMAZOO, MICH.



— AND ALL CAN BE OPERATED FROM 1 MOTOR

★ Look at the tools . . . *look at the prices!* If you're one of those men who have long wanted a home shop equipped with fine precision tools, but haven't wanted to spend the money for large, expensive machines — these Atlas Workshop Tools will suit you to perfection. Each one is backed by 40 years of Atlas precision-engineering. They give your shop *greater versatility at less cost* than any tools or

combination tool you can buy! — *and all 5 can be powered with 1 motor!* You'll want to see them at your first opportunity. Ask any Atlas or Atlas-Power King dealer for full details. Send the coupon for complete catalog.

SEND FOR FREE CATALOG

ATLAS PRESS CO.
1155W N. Pitcher St., Kalamazoo, Mich.
Please rush your Workshop Tool catalog.

Name _____

Address _____

City, State _____



ATLAS PRESS COMPANY
1055W N. PITCHER ST.
KALAMAZOO, MICH.

DEPENDABLE QUALITY TOOLS

Engineers Invade Another Wilderness

[Continued from page 101]

roads through forests to the site of Canyon Dam on the Nechako. A branch line of the transcontinental railroad that ends at Prince Rupert will be thrust across a wooded pass to Kitimat, and this obscure Indian village of 250 souls will become a city of 50,000.

Some engineers believe the tunnel west of Tahtsa Lake represents one of the two finest hydroelectric power sites left in North America. The other also has its origins in British Columbia. In mechanics, it is the same sort of Rube Goldberg gadget as Kitimat. Several of the lakes at the source of the Yukon River would be turned around to foam 19 miles through gorges and a tunnel to tidal flats along the Pacific Ocean. The Aluminum Company of America has already staked out ground in the vicinity of these flats.

Boom Outdoes Gold Rushes

Hydroelectric power is just one phase in the development of a fabulous frontier that until recently was largely overlooked.

The greatest land, mining and timber boom since the bygone settlement of the Oregon Country is stirring Canada's westernmost province, vast and picturesque British Columbia. It surpasses the Klondike and Nome and Cariboo gold rushes all rolled into one. More newcomers have migrated to British Columbia during the past 10 years than in the entire first century after a daring Argonaut named Alexander Mackenzie demonstrated that the North American continent could be crossed. Since 1940 the population of British Columbia has soared nearly 43 percent. This is triple the rate of growth in the rest of the continent.

Gas Pipe to Parallel Highway

Men with tractors and bulldozers are breaking the sod of remote valleys hemmed in by peaks more than two miles high. The most northerly pulp mills on the continent rear lofty chimneys above spruce and hemlock forests that until recently were threaded only by Indian trails. The biggest lead and zinc smelter on earth now stands along the upper reaches of the Columbia River. Soon Consolidated Mining will be made still bigger by a \$65,000,000 expansion.

The section of British Columbia tapped

[Continued on page 260]

10 Times Faster than hand sawing



PORTER-CABLE
Guild

ELECTRIC
SAW

A Professional Carpenter's Saw

6" model cuts 2"—Only **\$65.**
8" model cuts 2½"—Only **\$87**

Wait till you guide one of these smooth working Guilds through lumber . . . or plywood, compo-board, even aluminum siding! Then you'll know what *cutting speed* is! . . . and what the powerful Guild motor can do. You'll be amazed how easy it is to rip with one of these saws—how easily you can cross-cut, dado, plough or groove. Guild Saws are light and perfectly balanced—they've full safety protection—and they're extremely accurate. Best of all, they're THE BUYS OF THE YEAR IN POWER SAWS.

No other saw offers all the value-features of Guild: the new built-in tilting adjustment with easy-to-read quadrant giving angle setting up to 45°; new quick depth regulator which allows base to be raised or lowered by a mere twist of the knob; efficient helical gear drive; precision ball bearings; retractable safety guard; polished aluminum frame.

Look over both saws—decide which best suits your purpose—then take advantage of one of the most sensational value offers ever made. MAIL COUPON TODAY.

Please send me full information on the Guild 6" and Guild 8" Saws—also name of my nearest dealer.

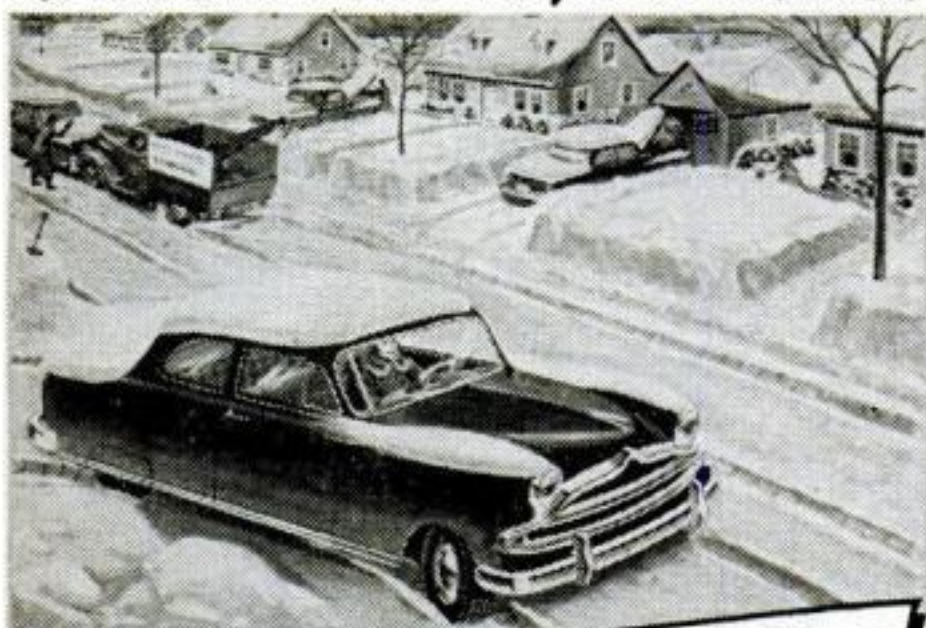
Name.....

Address.....

City.....State.....

PORTER-CABLE MACHINE CO.
6091 N. Salina St. Syracuse 8, N. Y.

be SURE of STARTING in any kind of weather!



BUY THE SENSATIONAL NEW **Redi-Warm** AUTOMATIC ENGINE TENDER

Thermo Stop-Start Engine Warmer



MAIN UNIT



NEUTRAL SWITCH



DASH SWITCH

At last the luxury of knowing your car will start as easily on a sub-zero morning as it will on a summer day. With a Redi-Warm Automatic Engine Tender in your car, it makes no difference where you park — how long you park. No outside electrical connections necessary — no smudge pots — no spark boosters. Just touch your starter, and you're off in a jiffy.

Widely acclaimed by automotive engineers, Redi-Warm is a marvel of simplicity. It consists of only three small units — a thermostatic control which clamps easily to the engine head; a neutral switch which permits Redi-Warm to operate only while the car is in neutral; and a dash switch with which to put Redi-Warm in operation.

Saves Engine Wear—Saves Gas

It is a well-known fact that the most wear on an engine occurs during the minutes required to start it. Redi-Warm, by keeping the engine at normal temperature — regardless of weather conditions — insures quick, easy starting — preserves the motor, saves on gas. Besides the comfort and convenience it affords, Redi-Warm will more than pay for itself in a few cold weather months.

Why risk loss of time — loss of temper — expensive towing charges? If your local dealer does not have Redi-Warm in stock, send for it direct from the factory. It costs only \$24.95 postpaid; comes with complete instructions for the simple wiring. Do it yourself, or ask your neighborhood serviceman. Sold on an absolute guarantee of full satisfaction.

only **\$24.95**
postpaid

- KEEPS ENGINE ALWAYS AT STARTING TEMPERATURE REGARDLESS OF WEATHER.
- CAR CANNOT BE STARTED WHILE REDI-WARM IS SET FOR OPERATION; THIEF-PROOF — FOOL-PROOF. DOUBLE BATTERY LIGHT.
- SAVES WEAR ON ENGINE; SAVES GAS ORDINARILY USED IN CHOKING.
- SAVES TIME — SAVES TEMPER — ELIMINATES COSTLY TOWING CHARGES.
- PAYS FOR ITSELF OVER AND OVER.

Agents
Wanted

CRAY-LINCOLN
Eng. & Mfg. Co., Inc.
CRAY OIL BLDG.
North Walpole, N.H., U.S.A.

Engineers Invade Another Wilderness [Continued from page 259]

by the Alaska Highway contains more than 37,000,000 acres where petroleum is believed to lurk. Already six or eight wells spout natural gas, giving promise to a pipe line along the highway and then southward to Vancouver, now Canada's third city in population.

In the green groves of Vancouver Island is rising the largest newsprint plant under construction anywhere in the world.

Rivers Flow in Three Directions

Few other places in this hemisphere are quite so diversified as British Columbia.

Ocean Falls on the thickly wooded sea-coast has the heaviest rainfall of any North American community. Yet sagebrush and tumbleweed worthy of the Mojave Desert glut some of the arid valleys of the interior.

British Columbia is ribbed with swift and mighty rivers that would be a legend elsewhere, but are virtually lost in this wilderness. The Fraser, the Stikine, the Skeena, the Bella Coola—they nourish a salmon industry of more value than that of any state, even of Oregon and Washington combined. Three of the great rivers of the globe have their sources in British Columbia: the Yukon, the Columbia and the Mackenzie. The province tilts in so many directions that its white-spumed rivers flow to the Pacific Ocean, the Bering Sea and the Arctic Ocean.

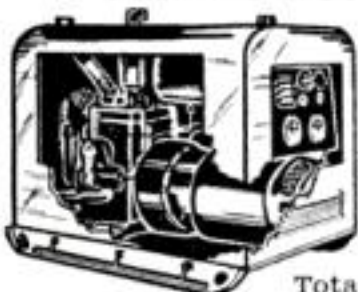
From fields of cantaloupe and apricot orchards in the south, British Columbia extends almost 200 miles beyond the Alaskan capital of Juneau in the north. It is probably the only domain in the world than can yield both reindeer meat and honey. Along its Stikine River roam almost as many great brown bears as on Kodiak Island in Alaska. Governor Ernest Gruening of Alaska once jested, "British Columbia is like Alaska—only more so."

Roads Open New Territories

The Alaska Highway extends for 618 miles upon the soil of British Columbia, as compared with only 302 miles inside Alaska itself. In fact it may have been the famous thoroughfare hacked through the wilds by American Engineer troops that first attracted the attention of investors and technicians to this 366,255-square-mile treasure trove of natural resources.

[Continued on page 262]

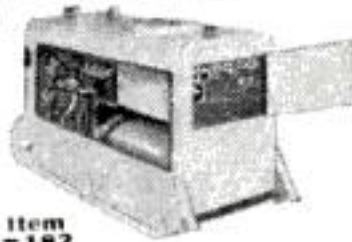
PREPARE NOW FOR POWER FAILURE! IMMEDIATE DELIVERY—LARGE STOCK—MANY SIZES



A. C. GENERATING PLANTS

DESIGNED FOR CONTINUOUS OR INTERMITTENT SERVICE

Item #133—3 KW—120 Volt—60 Cycle A.C. Single Phase HEAVY DUTY
PLENTY OF CURRENT TO OPERATE YOUR—• OIL BURNER • REFRIGERATOR
• HOME FREEZER • SUMP PUMP • POWER SAW • BROODER • CREAM
SEPARATOR • INCUBATOR • VENTILATING FANS • MILKING MACHINES
• BLOWERS • YARD LIGHTING • OTHER APPLIANCES



Item #182

Item #182—Onan Generator—5KW—120/240
volt—60 cycle A.C. single phase, direct coupled
to Willy's Jeep 4 cylinder engine. Shpg. Wt. 1200 lbs. F.O.B. Chicago. **895.00**

Item #178—350 watt—110 volt—60
cycle A.C., direct coupled to 1 cyl.
Inler Mideo engine. Shpg. Wt. 116
lbs. F.O.B. Chicago. **125.00**



Item #178

ITEM #133 Totally enclosed power unit with 2 cylinder water-cooled Hercules Model BXB engine direct coupled to generator. Magneto ignition, crank start, 4 gallon gas tank, 3 qt. oil capacity. Skid mounted with handrails for carrying. Instrument panel including killer button, oil pressure, water temp. gauges, voltmeter, ammeter. Shipping wt. 560 lbs. F.O.B. Chicago. **395.00**
Write for information on other size generating plants ranging from 350 watts to 25 KVA

HYDRAULIC SPEED REDUCER

WITH FINGERTIP CONTROL

ITEM #115



Variable output speeds ranging from 0 to input speed now available. Merely move control handle until desired speed is attained. Then turn locking handle to maintain the setting. Internal relief valves prevent overloading. Use input power of 1/4 to 1 1/2 H.P.

This Westinghouse-Oil Gear Unit converted to commercial use from 40 MM anti-aircraft traversing mechanisms consists of a variable displacement hydraulic pump feeding a fixed displacement hydraulic motor. These components are contained in a crackle-finish steel oil reservoir (capacity 2 qts.). Adjustable relief valves set at factory for 100 inch pounds of torque may be reset up to 180 inch pounds. Independent reverse control allows full output power and speed selection in either direction of rotation. Both input and output shafts measure 5/8" diam. Include keyway. Input rotation is counter-clockwise facing shaft. Recommended input speeds not to exceed 750 R.P.M. Overall dimensions 7 1/2"x7 1/2"x11 1/2". Gov't acquisition cost, \$428.00. Shipping weight 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago. **54.50**

GROBAN'S FALL & WINTER War Surplus SPECIALS!

ALL BRAND NEW

FULLY GUARANTEED

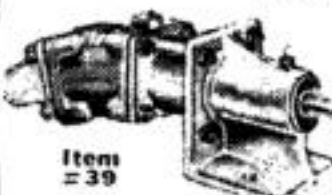
USE FOR:
• Reamer Drives
• Midnet Cars
• Feed Mills
• Canning Machines
• Conveyors
• Lathes
• Output Milling Machines
• Motor Boats
• Cream Separators
• Garden Tractors
• Pumps

HYDRAULIC EQUIPMENT

Large supply of new labor-saving, economical hydraulic equipment in many types and sizes. Use these positive, highly efficient smooth pressure hydraulics on presses, arbors, lifts, loaders, power control, positioning, brakes, plastic dies, auto frame alignment, etc., etc.

ITEM #70—Parolator hydraulic oil filter. Permanent element type. 3/4" female pipe thread ports. Capacity 16 gallons per minute. A \$12.00 value. Now **postpaid, 4.95**

ITEM #127—Double acting hydraulic cylinder. 1" bore, 1" stroke, 1/2" diam. shaft, 1/4" tubing thread ports. Overall length closed—6 1/2". Clevis mounting at both ends. Perfect for clamping and feeding. **Postpaid, 5.95**



Item #127

ITEM #33C—Double action hydraulic cylinder. 1 1/2" bore, 4 1/2" stroke. Clevis mountings at both ends. Uses 1/2" pipe fittings. **Postpaid 8.95**

ITEM #16C—Double acting hydraulic cylinder. 1 1/2" bore, 2 1/2" stroke. Will lift 1750 lbs. with 1000 PSI line pressure. Weight 8 lbs. A \$55.00 value. Now **16.95** Only. **Postpaid**



Item #39

Item #39—Vickers Hydraulic Pump Piston type. Ideal for use with hydraulic cylinders and valves described in this page ad. Vickers constant displacement pump delivers .507 cubic inches per revolution. 8 gallons per minute at 3750 R.P.M. 1000 PSI. Has 1/2" diam. shaft, 3/4"-18 thread inlet and outlet ports. Rotation—clockwise. Pnl. **19.90**

Item #126—Four-way, open center control valve with built-in adjustable relief valve. Factory set at 1000 PSI., spring-loaded neutral position for use with one double-acting cylinder. Fully balanced plunger type, smooth, positive, easy operation, can be used as single unit or mounted in series of any combinations desired. Has 3/4" pipe thread inlet and outlet, 1/2" pipe thread cylinder ports. Newly manufactured to our specifications. Shipping weight 8 1/2 lbs. An outstanding **21.50** Buy! F.O.B. Chicago.

ITEM #103—Double acting hydraulic cylinder. 2 1/2" bore, 17" stroke. Clevis mounting. Will lift 4900 lbs. with 1000 PSI line pressure. 1 1/2" diam. shaft, 3/8" tubing thread ports. Overall length closed 28". Shpg. wt. 11 lbs. F.O.B. Chicago. **21.50**



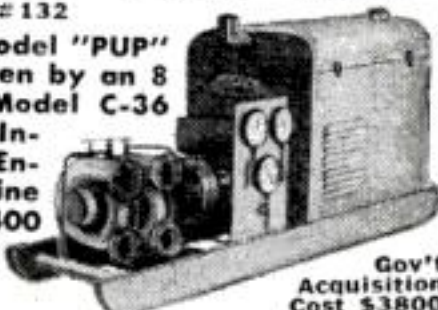
Item #103

ITEM #31C—Double action hydraulic cylinder. 3 1/2" bore, 11" stroke. Aluminum alloy cylinder wall and all steel 1 1/4" piston rod. Clevis mounting at base and shaft. 19 1/2" overall length closed. Will lift 9625 lbs. using 1000 PSI from Logan Heavy Duty Hydraulic pump. Uses 3/8" tubing fittings. Value \$102.00. Shipping wt. 11 lbs. F.O.B. Chicago. **22.50**

ITEM #6—Double action hydraulic cylinder. 3" bore, 24" stroke. Will lift 7070 lbs. with 1000 PSI line pressure. Steel barrel, 1 1/4" stainless steel shaft. Gov't. acq. cost \$176.00. Shpg. wt. 26 lbs. F.O.B. Chicago. **28.00**

ITEM #42—Double action hydraulic cylinder. 4" bore, 18" stroke. Rated lift capacity with 1000 PSI line pressure is 12,500 lbs. Shpg. wt. 30 lbs. F.O.B. Chicago. An Excellent **32.50** Buy for

Item #132
2 Stage Model "PUP"
Pump driven by an 8
Cylinder Model C-36
Chrysler Industrial
Engine. Engine
speed 2400
R P M —
100 H.P.



Gov't Acquisition Cost \$3800

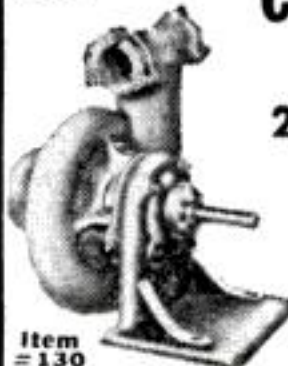
600 GPM at 175 PSI—Parallel connection
300 GPM at 375 PSI—Series connection
Ideal For • PIPE LINE SERVICE • IRRIGATION • PICK-UP • SALT WATER DISPOSAL • GATHERING • FIRE FIGHTING • DEWATERING • SPRINKLERS • CONSTRUCTION

These skid-mounted Pumping Units are standard production models with parts and service readily available. Designed for a wide range of operating conditions particularly where wide variation in head and capacity are required. Twin suction and discharge ports are cast on the same side and so arranged that external piping is interchangeable for either parallel or series pumping applications. Overall dimensions, 11 1/4" L x 20" W x 62" H. Weight 2480 lbs. Now, complete with operating instructions, performance data. F.O.B. Chicago. **1495.00**

GENERAL MOTORS—ALLISON

CENTRIFUGAL PUMP

200 GALLONS PER MINUTE



Item #130

• For Draining Basements • Fire-Fighting • Irrigation • Fuel Transfer • Swimming Pools • Home Water Systems • Dewatering

This General Motors-Allison Centrifugal Pump—designed for use on U. S. Air Force Mustang fighters, now converted for commercial, home, and industrial high volume pumping applications. Inlet, 2 1/2" standard pipe thread, twin outlets with 1 1/4" pipe thread, ball bearing supported 3/4" shaft. Easy, fast simple priming. Rotation, counter-clockwise facing shaft. Shipping wt. 35 lbs. Gov't acq. cost \$115.00. **39.50** F.O.B. Chicago Now Only.

Suction Lift	Head Pressure	Gal. Per Min.	H.P.	R.P.M.
10'	75'	260	6.0	3500
10'	65'	200	5.2	3500
10'	80'	40	1.3	2500
10'	50'	140	5.0	3500
10'	30'	100	3.0	2500

FREE: 1952, 48-PAGE CATALOG
You save on everything! Write today.

D. C. GENERATORS

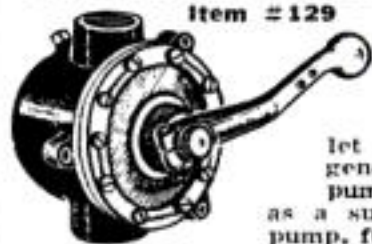
For welders, plating, truck and marine use, D. C. appliances, lights, etc. Aircraft quality—lifetime grease sealed ball bearings. Heavy duty.

Item #90—Type P-1, rated 200 Amps.—28 Volts, 2500 RPM. Mfd. by General Electric, Ford, Delco-Remy and Westinghouse. Gov't. Acq. Cost \$300.00. Shpg. wt. 53 lbs. F.O.B. Chicago. **22.50**

Item #91—Type R-1, rated 300 Amps.—30 Volts. Mfd. by Jack & Heintz. Gov't. Acq. Cost \$380.00. Shpg. wt. 59 lbs. F.O.B. Chicago. Each individually packed in wooden box. **35.00**

HAND FLUID PUMP

Item #129



etc. Shipping wt. 7 lbs. F.O.B. Chicago. **11.95**

Type D4—Bronze and aluminum construction. 3/4" pipe thread inlet and outlet. Fine general utility hand pump. May be used as a sump pump, barrel pump, fuel transfer pump.

ORDER DIRECT FROM AD — SEND PAYMENT OR PURCHASE ORDER TODAY — SATISFACTION GUARANTEED

GROBAN SUPPLY CO. 1139 SO. WABASH AVE., CHICAGO 5, ILL. DEPT. PS-11

BIG New Cummins COMBINATION DRILL and SAW KIT

SPECIAL OFFER...FOR LIMITED TIME ONLY

Order NOW and SAVE!

Only \$19.95

\$27.95 VALUE!

Here's YOUR chance to let power—Cummins Power—do the work! Does hundreds of jobs faster, better AND SO ECONOMICALLY!

This offer is good for a limited time only, SO ACT TODAY!

Model 190 Drill!

Portable Saw Attachment!

Saw Blade!

MAKES A PERFECT CHRISTMAS GIFT

Steel Drill Stand!

Three Drills!

JUST LOOK AT WHAT YOU GET!

Complete kit for all-around sawing and drilling — You'll use it on 90% of ALL the jobs around the house and in the shop! Cool running, perfectly balanced, 115 volt motor—2-1 planetary reduction gear for surging power—die-cast aluminum body—ball bearings for long life— $\frac{1}{4}$ " chuck for drilling—4 inch saw blade—base adjusts for maximum depth of cut of $1\frac{3}{4}$ "—Can be used as a portable saw, right on the job, or can be mounted in the sturdy, steel, horizontal base as a bench saw!

BUILT TO LAST AND BUILT TO WORK!

SEND ONLY \$1.00!

And pay the postman the balance, plus postage and small C.O.D. charge—or send \$19.95 and WE pay the charges.

ADAMSON SALES CO.

7301 So. Halsted—Chicago 21, Illinois

☐ I enclose \$1.00. Send me the Big Combination offer. I will pay the postman balance, plus postage and C.O.D. charges.

☐ I enclose \$19.95. Send me the big Combination offer postpaid.

Name _____

Address _____

City _____

State _____

Engineers Invade Another Wilderness

[Continued from page 260]

From the raw and booming lumber city of Prince George, its population up a prodigious 210 percent since 1940, the Provincial Department of Public Works is slashing a costly road through the muskeg to connect with the Alaska Highway. This road will be ready early in 1953.

Railroads Shrink Wilderness

By that time Prince George will be a bustling rail citadel in the backwoods, with the echo of locomotive whistles caroming off the crags. Track crews are extending the scenic Pacific Great Eastern Railway into Prince George. There it will link up with the northern transcontinental branch of the Canadian National, which has its terminus at Prince Rupert on the seacoast. This was once the old Grand Trunk Pacific, constructed 40 years ago by a bearded American named Charles Melville Hays, who saw it as the shortest avenue to the lush trade coming from the Orient.

During World War II it was a railroad of destiny. The U. S. Army ballasted the main line and lengthened spurs. Over these wilderness rails traveled the soldiers and equipment headed for the defense of Alaska. The timbered hills near Prince Rupert were honeycombed with ammunition dumps. Fearful of another Halifax or Black Tom disaster, the Joint Chiefs of Staff ordered blockbusters hauled to the Pacific over this lonely route bisecting three mountain ranges, rather than through the congested harbors of Seattle, Portland and San Diego.

Loggers Find Paradise

The concrete docks where bombs were loaded for Okinawa and Guadalcanal now are heaped with logs. The powder dumps have given way to the chemical baths where high-acetate wood pulp is dissolved. At this farthest north of all railroads on the Pacific seaboard, the Celanese Corporation of America has just constructed a mill that will produce the raw material for 200,000,000 pounds of yarn and fiber annually.

At the ends of fiords as deep and majestic as the Yosemite Valley, logging crews are toppling spruce and hemlock sentinels that were growing in 1792 when Captain George Vancouver sailed along this coastline in H.M.S. *Discovery*. Some of the loggers live

[Continued on page 264]



Now YOU can do it!

Your bathroom or kitchen can have that smart, modern look with ...

"INSTALL IT YOURSELF"

VIKON METAL TILE

VIKON TILE Is Economical ... Easy To Install

Here's how to put new life and sparkle into drab, colorless rooms ... quickly and inexpensively ... with Vikon Metal Tile ... do the entire job yourself in your spare time! It's ideal for walls and ceilings of kitchens, bathrooms, showers, laundry rooms, utility rooms and game rooms.

You have 30 beautiful fade-resistant decorator colors to choose from in both steel and aluminum ... also stainless steel.

Look at these features:

- Will not warp, chip or craze
- Resists heat and ordinary household chemicals
- Fireproof, waterproof, a seal against insects
- Can be bent for corners or cut to fit special needs
- Easy to keep clean



Vikon's handy installation kit will give you all the tools to do a professional-looking job.



STEEL • ALUMINUM • STAINLESS STEEL

VIKON TILE
BEAUTY • ECONOMY **COLOR METAL** DURABILITY

"The Original Individual Metal Tile"
Established 1926

FREE SAMPLE and COLOR BROCHURE

Send today for your free copy of Vikon's full-color, descriptive brochure and sample of tile. You be the judge of its quality and adaptability to your home. No cost or obligation involved. Simply fill out and mail the coupon.

VIKON TILE CORPORATION

WASHINGTON, NEW JERSEY, DEPT. P. S. 2

Please send me without cost or obligation, a full-color, descriptive brochure and sample of Vikon Tile.

Name..... (Please Print)

Street Address.....

City.....Zone.....State.....



for ... POWER LAWNMOWERS,
MOTOR SCOOTERS, GARDEN
TRACTORS, MOTORBIKES, ETC.

The Way to transmit Power Smoothly

WRITE
FOR
FREE
FOLDER

V-PLEX CLUTCHES automatically tighten drive belt as throttle is opened, eliminate belt slippage, cut wear, permit idling engine. Easily installed on any gas engine; practically indestructible. Fit 1/2, 5/8, 3/4" drive shafts. See dealer or write.

MFG. BY V-PLEX CLUTCH DIVISION
LIGHT INSPECTION CAR WORKS — HAGERSTOWN, INDIANA

ask your dealer for
Red Devil
putty knives and
wall scrapers

THE CRAFTSMAN'S
WELL-TEMPERED FRIEND



Send for the **NEW** 96 page

Red Devil catalog No. 21
Address Dept. P.S.

RED DEVIL TOOLS, IRVINGTON 11, N. J., U. S. A.

*You give him **SKIL** tools
...we'll give him the plans!*



**... and your gift will pay
for itself many times over**

You give him SKIL Home Shop Tools for Christmas and we'll give him six SKIL-Charts, detailed plans for home projects he can build by himself in his spare time! Send in the coupon below. *Thousands* have found a world of enjoyment in this money-saving hobby!

SKIL Home Shop Tools are sturdy and dependable. And there's one for every home shop need. Whether he builds furniture or a garage, these money-saving tools will speed work and give him many hours of pleasure all year long!



SKIL Home Shop Saw—Model 520; 5⁷/₈" diameter blade. Weight: 10¹/₂ pounds. Depth adjustment from 3/4" to 1⁷/₈". Quickly adjusts for bevel cutting any angle up to 45°. With suitable blades you can cut wood, metal and plastics. \$59.50.

Prices subject to change without notice



Made only by Skil saw, Inc.
5033 Elston Avenue,
Chicago 30, Ill.

In Canada: Skiltools, Ltd.
3601 Dundas Street West,
Toronto 9, Ont.

Send in Coupon Now for Six FREE SKIL-Charts

SKILSAW, Inc., Dept. D-111
5033 Elston Ave.
Chicago 30, Ill.

FREE! Set of 6 SKIL-Charts show how to buy materials and build wonderful home projects like those above. Just mail the coupon today!

Name _____
Street _____
City _____ State _____

Engineers Invade Another Wilderness

[Continued from page 262]

in barracks where only the tepees of Indians or the lean-to's of patrolling Mounties have stood before. Others bivouac in wanigans, those cabins on barges that can be pulled by tugs from inlet to inlet.

Much of British Columbia's timber cloaks mountains that dip into the sea. Logs are floated to Prince Rupert in cigar-shaped rafts. Under a special license from the provincial government, the Celanese Corporation can level only as much timber as comes to maturity each year.

Mantling an area considerably more than twice the size of New York State, the forests of British Columbia do more than produce lumber and pulp. Their roots hold rain and snowfall in the ground and thus provide great rivers with a steady flow.

Pioneers in Play Clothes

Each year Americans spend \$35,000,000 looking over this land of contrasting luxury resorts and primitive camps—a frontier province where Royal Mounties with traditional Stetson hats and white lanyards maintain law and order. Visitors may bask in tile swimming pools, or try to climb a granite spire as precipitous as the Empire State Building. By paying a \$60 trophy fee, a hunter can take out a moose head with huge palm antlers. Many an American stays on to try his luck at accumulating a bonanza as well as catching the 30-inch Kamloops trout.

One recent example symbolizes the whole new order of things. A mackinaw-clad visitor, an advance agent of the construction outfit pioneering the Kitimat power project, got off train No. 195 at the resort town of Burns Lake. He rang the bell at the desk of the local hotel where fishermen and moose hunters spend their first night.

People Come to Stay

"I want to reserve a dozen rooms," he said.

"For how long?" asked the clerk.

"Four years," replied the stranger.

When other hinterlands were opened up, it was in the age of the ox team and the single-bladed plow. Now we see a rich frontier of unlimited possibilities being developed in the era of the giant power plant, the streamlined locomotive and nuclear fission. At one stride, British Columbia is going from wilderness to industrial greatness. **END**

SURPLUS MACHINE SHOP TOOLS AT PRICES YOU CAN AFFORD

HIGH SPEED DRILLS

1/4" to 1/2" with 1/4" Shanks
1/2" to 1" with 1/2" Shanks



For the first time at these low prices! HIGH SPEED DRILL BITS UP TO 1/2" FOR YOUR 1/4" DRILL AND HIGH SPEED DRILL BITS UP TO 1-3/16" FOR YOUR 1/2" DRILL. The Tungsten steel content of these drills means they will outlast carbon and regular steel drills many, many times!

DRILLS UP TO 1/2" FOR YOUR 1/4" DRILLS!			
Will Fit Any Size Chuck 1/4" and Larger			
SIZE	PRICE EA.	SIZE	PRICE EA.
1/4"	.30	25/64	.60
17/64	.45	13/32	.60
9/32	.45	27/64	.65
19/64	.48	7/16	.65
5/16	.48	29/64	.73
21/64	.50	15/32	.73
11/32	.50	31/64	.75
23/64	.55	1/2"	.80
3/8	.55	33/64	.90
		17/32	.90

DRILLS UP TO 1-3/16" FOR YOUR 1/2" DRILLS!			
Will Fit Any Size Chuck 1/2" and Larger			
SIZE	PRICE EA.	SIZE	PRICE EA.
33/64	.91	25/32	\$1.86
17/32	.91	51/64	2.05
35/64	1.14	13/16	2.05
9/16	1.14	53/64	2.15
37/64	1.24	55/64	2.25
19/32	1.24	7/8	2.25
39/64	1.30	15/16	2.43
41/64	1.43	31/32	2.50
21/32	1.43	1-1/32	2.80
43/64	1.55	1-1/16	3.05
47/64	1.80	1-5/64	3.56
3/4	1.80	1-5/32	3.98
		1-3/16	4.10



HIGH SPEED HAND TAPS

Slightly Used, Excellent Condition			
SIZE	PRICE EA.	SIZE	PRICE EA.
8-36 (new)	.35	1/2"-NC or NF	.47
1/4"-NC or NF	.26	9/16"-NC or NF	.60
5/16"-NC or NF	.29	5/8"-NF	.66
3/8"-NC or NF	.33	3/4"-NF	.80
7/16"-NC or NF	.39	1"-NF	1.25

HIGH SPEED MORSE TAPER SHANK DRILLS

SET 10U 20 Different Size High Speed Morse Taper Shank Drills from 1/4" to 1". \$70 Value. Priced at only **\$12.95**

SET 10 10 Different Size 15U High Speed Morse Taper Shank Drills from 1/2" to 1-1/4". \$50 Value. Priced at only **\$9.95**

SET 8 8 Different Size High Speed Morse 37U Taper Shank Drills from 1" to 2" with No. 3, 4, and 5 tapers. \$125 Value. Priced only **\$29.95**

HIGH SPEED TAPER SHANK CHUCKING REAMERS

SET 15 15 Different Size High 25U Speed Morse Taper Shank Chucking Reamers up to 1/2" with No. 1 and 2 tapers. Priced at only **\$6.95**

SET 8 8 Different Size High 13U Speed Morse Taper Shank Chucking Reamers from 1/4" to 1". Priced at only **\$4.95**

SET 10 10 Different Size High Speed Morse 12U Taper Shank Chucking Reamers from 1/4" to 1-1/8". \$65.00 value. Priced at only **\$9.95**

HIGH SPEED STRAIGHT SHANK CHUCKING REAMERS

SET 20 20 Different Size High 16U Speed Straight Shank Chucking Reamers up to 1/2". Priced at only **\$7.95**

SET 10 10 Different Size High 17U Speed Straight Shank Chucking Reamers from 1/2" to 1-1/8". Priced at only **\$9.95**

SET 15 15 Different Size High Speed Straight Shank Chucking Reamers from 1/4" to 1". Priced at only **\$6.95**

6 Slitting Saws with Mandrel

SET 6 Different Size High Speed Slitting Saws, 2 3/4" dia. x 1" arbor. Thickness from .040 to .071. Cuts wood, aluminum, brass, steel, etc. PLUS SPECIAL MANDREL which enables use of saws in 1/4" or 1/2" elec. drill. \$25 Value. Only **\$4.95**



COMBINATION DRILL AND COUNTERSINKS

SET 8 selected sizes from C2 to F2 (1/16 drill x 13/64 body to 3/16 drill x 7/16 body) 60 degree angle of countersink. New cost on these countersinks 75c to \$2.50 when available. Your price for set of 8, only **\$4.95**



High Speed Woodruff Key Seat Cutter

SET 5 Different Size Cutters. 4U Can be used as mounted milling cutter or circular saw. All with 1/2" shanks, widths up to 1/4". diameters up to 1-1/2". Priced at only **\$3.95**

BRAND NEW ROTARY FILES

SET 7 Different pcs. 5U High Speed 1/4" Shanks. (Complete Set for Less Than Cost of 1 Rotary File) **\$4.49**

SET 14 Different pcs. 22U as above **\$8.79**

NEW HIGH SPEED REX CUT-OFF BLADES

1/8" x 3/4" x 6"	\$1.24 ea.
1/8" x 7/8" x 8"	1.24 ea.
3/16" x 1 1/8" x 6 1/2"	1.34 ea.
3/16" x 1 1/8" x 8"	1.34 ea.
3/16" x 1 1/8" x 8"	1.34 ea.
1/4" x 1 1/2" x 7"	1.34 ea.
1/4" x 1 1/2" x 10"	1.50 ea.

Discounts on Quantities

LARGE SAW BLADES

These large semi-high speed steel, flat ground, circular blades are in excellent, usable condition. Excellent for cutting brass, copper, aluminum and other soft metals, bone, plastics, rubber, paper, etc. 8 x 1/16 x 5/8 arbor \$2.75 ea. 10 x 3/32 x 1 arbor \$3.00 ea. 12 x 3/32 x 1 arbor \$4.00 ea. 14 x 3/32 x 1 arbor \$4.49 ea.

HIGH SPEED STRAIGHT SHANK DOUBLE END END MILLS

SET 4 Right hand twist 7/16 shank end mills, size 5/16 to 7/16. **\$3.95**

NEW CARBIDE TIP MASONRY DRILL

Carbide tip goes through any masonry. Set of 5 bits containing one 7/32"; three 1/4" and one 5/16", all five, \$10 Value. Only **\$2.49**

GOOD USABLE HIGH SPEED MILLING CUTTERS

SIDE MILLING CUTTERS				STAGGER TOOTH CUTTERS				PLAIN MILLING CUTTERS			
Dia.	Width	Arbor Hole	Price Each	Dia.	Width	Arbor Hole	Price Each	Dia.	Width	Arbor Hole	Price Each
4"	1/4"	1"	\$3.49	4"	5/16"	1 1/4"	\$3.49	2"	1/4"	1"	\$1.79
4"	3/16"	1 1/4"	3.25	5"	1/16"	1 1/4"	\$2.49	2"	3/8"	7/8"	1.79
4"	1/8"	1"	3.10	4"	3/16"	1 1/4"	2.49	2 1/2"	2"	1"	3.00
3"	5/16"	1 1/4"	1.95	60° double angle 1 1/4" arbor 2 1/4" dia.			\$2.95	3"	3/8"	1 1/4"	1.97
2 3/4"	5/16"	1 1/4"	1.95	30° single angle 1" arbor 2 7/8" dia.			\$2.95	4"	3"	1 1/4"	9.95
2 1/2"	3/8"	3/4"	1.79	3/32" dia. convex cutter 5/8" arbor 1 1/4" dia.			\$1.29	4"	4"	1 1/4"	9.95
2"	1/4"	7/8"	1.49								

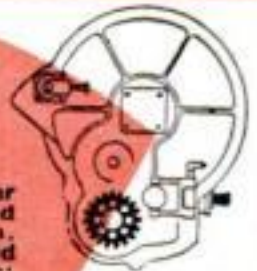
Money-Back Guarantee—All Mdse. Mixture of New and Reconditioned Tools Unless Specified Brand New—All Orders (Except Those Specified F.O.B. Tulsa) Are Shipped Post Paid, saving you up to 25% on total delivered cost.

Write for Free Catalog Describing Thousands of Bargain Cutting Tools.

T & T TOOL 221 W. SECOND TULSA, OKLA.

THREE-SPEED TRANSMISSION

Contains 7 assorted spur and beveled gears. Has auxiliary power take-off driven from main drive. Three separate gear ratios are 16:1, 12:1 and 3:1. Contains 10 1/2" dia. ring gear, 5", 2 1/2" and 1 1/2" dia. bevel gears; 3 1/4", 4" and 2 1/4" dia. spur gears. All mounted on precision ball-bearings. Main drive has throw-in hand clutch. Auxiliary drive can be engaged or disengaged. Excellent for transmission, winch and many other uses. F.O.B. **\$9.98**



10 TO 1 GEAR BOX: throw-out type clutch, ball-bearing throughout, 1/2" drive spline, 3 1/4" output gear, rated up to **\$6.49**

90° HEAVY DUTY GEAR BOX: Ball-bearing throughout with 1 1/2" drive spline, 1:1 gear ratio which can be changed by different size pulleys or gears. Wt. 5 1/4 lbs. Length 11". beveled gears. Excellent for hot rods, power mowers, etc. Only **\$5.95**

VEEDER ROOT COUNTERS

3 U.g. clockwise rotation type **\$1.49**
(New) ...
4 Digit clockwise rotation type **\$1.89**
(New) ...
5 Digit clockwise rotation type (Reconditioned) **\$2.89**
5 Digit ratchet type (Reconditioned) **\$2.49**
5 Digit clockwise rotation type with key reset, complete with key, counts in fives. (Reconditioned) **\$2.75**
5 Digit ratchet type, with key reset complete with key, counts in singles. New cost about \$17.00 when available. (Reconditioned) Only **\$3.49**
All counters guaranteed against mechanical defects



NEW VICKERS MF9 HYDRAULIC PUMP OR MOTOR

\$120 New Cost
Unit is compact, powerful. Rated at 1,000 P.S.I., .600 cu. in. Per Rev. 8 gals. per min. at 3,750 R.P.M. Change rotation by reversing flow. Delivers up to 6 H.P. Requires 1/4 to 6 H.P. to drive directly or by pulley. Only 135 available. Price **\$16.95** at only fraction of new cost.
NOTE: These Vickers Pumps or Motors will fit directly to drive spline of the three gear boxes listed above.

MULTI-PURPOSE PUMP

Three independent pump sections running off of one shaft for single or multiple pumping. Use one as a vacuum pump capable of drawing 25 inches of mercury. The other one or two pumps can be used as a power for sprayers, basement drain, stock watering, etc. Each section rated at 10 G.P.M. at 40 P.S.I. Comes complete with mounting base and 4" drive gear. Only **\$8.95**



NEW MOUNTED STONES
SET Mixture of 12 Mounted Stones 27U with 1/4" shanks. **\$1.98**
SET 24 of 39U above **\$3.95**



Magic Clips
Attach Chains
To Auto Wheels
Instantly



Pat. Pending

Get Out of Trouble After Your Car is Stuck

On Ice, In Snow, Mud or Sand

An amazing new invention . . . PRESTO Emergency Tire Chains are snapped on to wheels instantly after your car is stuck . . . not before. This assures a saving in fuel, tire wear and time . . . you drive smoothly along with complete confidence of having efficient traction to get out of trouble from wheels spinning next to the curb, in ruts, on ice at intersections, getting up that sloping driveway, off wet and muddy highway shoulders, in mud or snow. Chains are used only when needed and therefore give years of service. There are no straps to tighten . . . no jacking up the car . . . no loss of time, fuel and tires because you can get your car out of trouble instantly, this easy PRESTO way: Magic clips are inserted between the tire and rim (like wheel balancers) and chains are attached instantly when needed.

Wheels stay in balance and the clips are unnoticed. One box of four Chains (enough for one car) assures trouble-free driving. Order direct for two weeks trial on our money-back guarantee of your entire satisfaction. Postage prepaid if payment in full is sent with order, or write for free circular.



NO. 1 SIZE (for one car) fit 5.25 to 7.20 tires, \$5.95. NO. 2 SIZE (for one car) fit 7.60 to 8.20 tires, \$6.45.

Dealers, Agents Wanted.

PRESTO CHAIN CO. 215 W. 7th St.
 Des Moines 2, Ia.

500-Lb. Car for \$500

[Continued from page 109]

the car themselves. For others there's the corner garage or motorcycle repair shop.

Lubrication is so simple you don't need a service-station grease job: Engine oil is added or changed as necessary. The front shocks are filled with oil. Wheel bearings need packing twice a year as on big cars. That leaves only the steering and reverse-gear cases, jackshaft bearings, rear-wheel mounts, and chain to lubricate.

Drive after dark, too. The battery-less version of the King Midget can be ordered with lights and a 35-watt, compensated-output AC generator. You have to reach back over the deck to a lever that moves the generator against the engine fly-wheel (what do you want, dash control?). The automatic compensation gives you good lights even at low speed. The dimmer switch is on the dash.

Where state laws require parking lights independent of the engine, a dry-cell standby battery can be installed.

Any color, as long as it's cream. As part of the price struggle, the makers of the King Midget have standardized everything—even the overspray in the paint booth. It has to help finish the next car, for they spray a cream finish on six cars at once. If you want some other color, it will cost you ten bucks extra.

Buy it knocked down. If you buy a King Midget fully assembled, it will come in its own crate, which you have only to open at one end to roll the car out, ready to run. The crate is returnable.

You can save a few bucks by ordering it in separate units—chassis, engine and drive, fenders, body and so forth. All parts are prefabricated and can be assembled with just a few tools. A booklet giving assembly instructions is provided. If you buy it unassembled, you have to paint it yourself. **END**

Screw-Nails Stop Floor Squeaks

SQUEAKY flooring may be prevented by applying the planks with helical-threaded nails, Virginia Polytechnic Institute's Wood Laboratory reports. Driven with a hammer but holding like screws, the nails show far greater and more lasting holding power than cut flooring nails or plain-shank flooring brads of equal size. Earlier Institute tests (PS, Sept. '50, p. 126) have demonstrated the usefulness of the helical-threaded nails called Screw-tite nails, in other applications.

IT'S SUPER FAST! IT'S SUPER SAFE!

It's the ideal machine for home workshops

This versatile, all-purpose, low-cost

DE WALT "power shop"

does everything in woodworking!

It's a SAW



It's a DADO



It's a SHAPER



It's a ROUTER



It's a JIG SAW



It's a LATHE



It's a DISC SANDER



SELLS FOR \$229
motor included

Many times you've probably wanted a machine like this for your home workshop!

It's the world-famous DE WALT radial power saw. It's fast... accurate!

It's safe... and takes up so little space! You'll find a thousand and one uses for DE WALT... as you make furniture, cabinets, shelves, build your own garage or house.

Remember... DE WALT is *more* than a saw! Every time you change the cutting tool, you have *another* machine. DE WALT dados, routs, shapes, grinds, tenons, drills, etc.

Learn all about DE WALT now. Own this superb power shop! Use coupon to get descriptive literature.

DE WALT INC.

A Subsidiary of American
Machine and Foundry Company



SEND FOR THIS FOLDER!

DE WALT, INC.

PS-11 Fountain Ave., Lancaster, Penna.

Please send me descriptive literature on the DeWalt Power Shop.

Name.....

Address.....

City.....State.....

AT LAST! A FASTER, BETTER WAY TO PREPARE HOLES FOR WOOD SCREWS!

U. S. and Foreign Patents Pending

Screw-Mate 3-IN-1 DRILLS



In **ONE** Quick and Easy Operation

NEW DRILL INVENTION SAVES TIME! MAKES SCREW-JOINTS STRONGER!

Each Screw-Mate drill corresponds to the exact contour of a screw. That means you can countersink, drill shank clearance and tapered pilot hole—all at the same time! No longer must you perform 3 drilling operations, or attach special countersinks and counterbores to drills.

The tapered hole made by a Screw-Mate drill enables every thread on the screw to hold tightly—right down to the tip. (Ordinary drill makes straight pilot hole—allows only part of threads to come in contact with wood. Strength is sacrificed.) Screw-Mates are slightly smaller than corresponding screw diameter to provide a good snug fit. This increased holding power allows use of smaller screws. Drill shoulder stops drill at exactly right depth and size.

Screw-Mates are available in a wide variety of sizes for use with most screw sizes on wood, plastics, slates, synthetics, etc. Made of tough high-tungsten steel, they outlive ordinary drills. Screw-Mates fit any drill gun, drill press, or hand drill.

Buy Screw-Mates at your local hardware store today! If local dealer cannot supply you, order by mail, using coupon below. Include cash or money order. No C.O.D.'s. (Dealer inquiries invited)

MAIL
COUPON
TODAY!

(Circle all the drill sizes you desire)

SCREW-MATE SIZES NOW AVAILABLE!

\$.75 each

5 x 1 1/2"

6 x 3/4"

7 x 3/4"

8 x 3/4"

8 x 1"

8 x 1 1/4"

8 x 1 1/2"

10 x 1"

10 x 1 1/4"

10 x 1 1/2"

10 x 2"

12 x 1 1/4"

12 x 1 1/2"

12 x 1 3/4"

12 x 2"

14 x 1 1/4"

14 x 1 1/2"

12 x 2 1/2"

14 x 2"

\$1.00 each

(Diameter of drill, shank is 1/4".)

Handy Utility Set
3 commonly used sizes
packed in handy
drill-holder-box.



\$3.75—set of 3 drills

- ☐ Please rush me postpaid the Screw-Mate drills circled above. Enclosed is \$.....in full payment.
- ☐ Send me FREE information on Screw-Mate drills.

Name.....

Address.....

(Please print name and address of your local dealer in margin)

D. R. CARNER COMPANY, INC.
104-N HOSPITAL ST., PROVIDENCE, R. I.
Distributing Office for the Mfr.

Shaw Drives the Minx

[Continued from page 126]

for the road across a hood that stretches into the next county . . .

The suspension was so interesting that I took the car over the Speedway's rough infield to see how it felt.

You don't need a big car to get a soft ride . . . With this short wheelbase, you'd expect a lot of pitch on rough ground . . . and you don't get it . . . The front end is just slightly soft . . . she dives a little on a hard bump.

"I like that hood," I remarked to J. Godolphin, the Rootes midwestern service manager who had brought the sedan and a Minx convertible down from Chicago. He was very British.

"The bonnet?" he corrected me with a grin. "The hood is a convertible's top."

High Speed for Low Power

The convertible was the snappier of the two cars, but I stuck to the hard-top for my evaluation. A British motor magazine had clocked a 1950 Minx sedan at 40.2 seconds from a standing start to an indicated 60 miles an hour. The 1951 Minx has a slightly larger engine. I took off for the backstretch.

You have to know how to drive these low-horsepower engines . . . or they lug in high gear at low speed . . . and that's not good for any engine . . . We'll run through three gears to 60 . . . Fifteen seconds, 20 . . . 28, with the wind.

I turned and took it against the wind.

. . . Twenty-five . . . 27 . . . 30 to an indicated 60.

Then I tried going through four gears, both directions, to get the advantage of quick initial acceleration. It was better. I averaged out to 26.3 seconds. The speedometer later calibrated by stopwatch to a measured quarter-mile at 57 miles an hour when indicating 60. That, for my money, was tops on 42 horsepower.

The British Are Honest

It took three-quarters of a mile, however, to make the Minx touch 74 miles an hour indicated, its top speed. That left something to be desired. The British are rigorously honest, by the way. The speedometer-dial readings on the Minx go to 75 and stop, period.

"Quite a sedan," I remarked to Mr. Godolphin as I returned to the pits.

"You mean a saloon," he said.

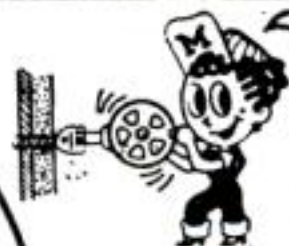
"Well," I laughed, "that word means something else over here."

END



MOLLY SCREW ANCHORS

WHERE SCREWS
WON'T HOLD



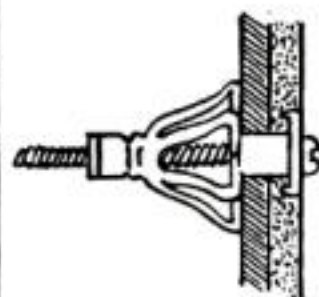
FIRST...
DRILL HOLE SAME
SIZE AS THE MOLLY
... THEN INSERT
MOLLY

MOLLY FASTENS FIXTURES
SECURELY TO WALLS,
FLOORS AND CEILINGS.

NO SPECIAL
TOOLS NEEDED



USE A
SCREW
DRIVER TO
TURN
SCREW



NOW MOLLY
IS FULLY
INSTALLED



IT'S EASY TO INSTALL THESE FIXTURES WITH MOLLY SCREW ANCHORS

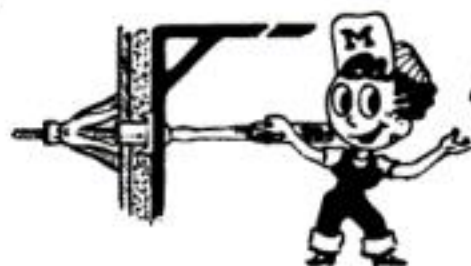
Sinks • Soap Dishes • Fuse Boxes • Wall Clocks • Mirrors
Stair Hand Rails • Drapery Fixtures • Electric Fan Brackets
Bathroom Cabinets • Tool Racks • Venetian Blind Fixtures
Kitchen Cabinets • Awnings • Towel Racks • Wall Brackets
Shelving • Heavy Pictures • Door Chimes • Curtain Fixtures

Write For **FREE** Descriptive Folder
Explaining The Many Uses For Molly
In The Home.

NEXT...
REMOVE THE
SCREW



NOW...
PLACE
FIXTURE IN
POSITION.
RETURN SCREW
AND TIGHTEN.



FIXTURES NOW CAN
BE REMOVED AND
REPLACED AT WILL

ASK YOUR HARDWARE DEALER

MOLLY CORPORATION

Dept. 1165

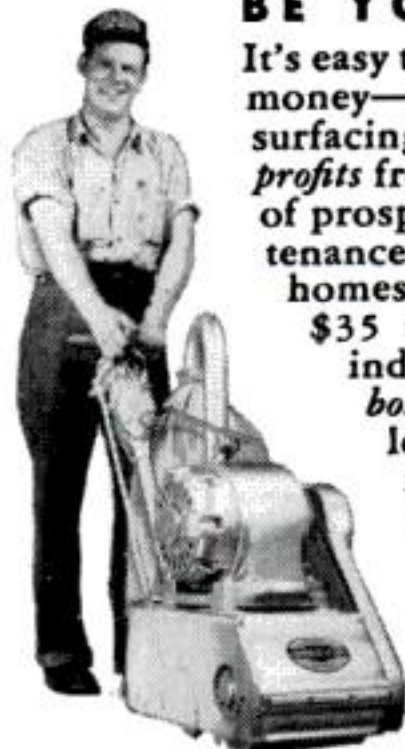
READING, PA.

MAKE
Big Money
SANDING
FLOORS!



BE YOUR OWN BOSS

It's easy to turn your own labor into money—**BIG MONEY**—in floor surfacing work. You keep *all the profits* from your labor! Thousands of prospects—sand floors in maintenance or remodeling of old homes... also new homes! Earn \$35 to \$50 a day... pleasant indoor work... and *you are boss!* Send for "tell-all" booklet entitled "Opportunities in Floor Surfacing" enclosing 25 cents in coin or stamps to cover handling. The American Floor Surfacing Machine Co., 532 So. St. Clair St., Toledo 3, Ohio.



AMERICAN

FLOOR MACHINES • PORTABLE TOOLS



*The Rougher The Road
The Better They Work*



MONRO-MATIC Shock Absorbers Automatically Self-Adjusting to Road and Load

Monro-Matics are never too "hard" for smooth roads, never too "soft" for rough ones. They *adjust themselves* to changing road conditions, keeping spring action under constant control and giving a smoother, safer ride.

Send 10¢ FOR INSTRUCTIONS
ON HOW TO INSTALL
SHOCK ABSORBERS

MONRO-MATICS are so easy to install that you can do it yourself. Just follow the simple instructions in the book. Get your copy now—it tells everything you need to know about shock absorber installation and service.

MONROE SHOCK ABSORBERS are standard equipment on more makes of new cars than any other brand.



MONROE

MONROE AUTO EQUIPMENT CO., Dept. B MONROE, MICH.

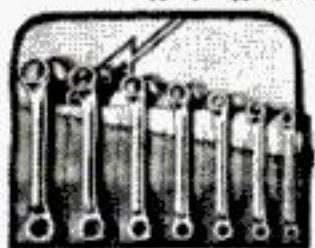


Snap-on Tools

Fine tools are grand gifts . . . and nothing could be finer than a set that carries the famed "Snap-on" trademark! Here are shown several of the most popular Snap-on standard sets. Never sold in stores — order direct from factory.

MASTER SUPREME WRENCH SET

In handsome steel case, a full set of the most needed wrenches for general work. Four handles including ratchet and speeder—3 extensions—a universal joint and 15 sockets, sizes $\frac{7}{16}$ " to $1\frac{1}{4}$ ". **\$42⁹⁵**

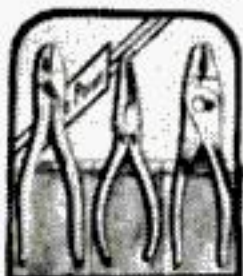


DWARF BOXOCKET SET

7 wrenches with 14 openings fit all nuts $\frac{5}{16}$ " to $1\frac{3}{16}$ ". Forged from toughest steel, accurately double broached to close tolerances. Polished chrome finish. In kit bag. **\$9⁹⁵**

OPEN END WRENCH SET

7 wrenches with 14 openings, heads set at 30° and 60° angles to turn hardest-to-reach nuts in $\frac{3}{8}$ " to $\frac{3}{4}$ " sizes. In leatherette kit bag. **\$10⁰⁵**



BASIC PLIER SET

3 basic pliers most often used in everyday work. 7" diagonal cutters—6" needle nose—7" gripper-cutter—all finely finished precision tools in handy kit bag. **\$11⁰⁵**

WRITE FOR FREE CATALOG!

These sets will please any man who appreciates fine tools. But there are many others—the complete Snap-on line includes more than 4,000 tools. You buy direct from factory (or from Snap-on factory branch in larger cities). The Snap-on catalog is free—write for it today!



Snap-on Tools
THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION

8060-K 28th Avenue
Kenosha, Wisconsin

*Snap-on is the Trademark of Snap-on Tools Corporation.



IT'S easy to turn unused attic space into your own private "office" with new Gold Bond Insulation Board. It comes in big ivory coated panels that are easy to nail in place. Also supplied in tiles and random width planks in ivory and harmonizing variegated blends. By combining these products there's no end to the beautiful effects that can be achieved. You will not only have an attractive room, but one that's insulated... warmer in winter, cooler in summer.

Available at your local Gold Bond Lumber and Building Materials Dealer!

NATIONAL GYPSUM COMPANY
BUFFALO 2, NEW YORK

★ Make your paint removing EASIER!

Removing paint is so much easier with WONDER-PASTE. Applied with a brush, it reduces toughest paint, enamel or varnish to a soft mass—easily removed with a putty knife. No hard scraping or sanding! Safer and easier than using a heavy torch. At paint and hardware stores.



★ WONDER-PASTE Write for leaflet

Wilson-Imperial Company, 121 Chestnut Street, Newark 5, N. J.

NEW!

POLARVISION SAFETY LIGHT



A revolutionary new light discovery recently released for civilian use.

STOP HEADLIGHT GLARE

Fits All Cars & Trucks

FOR SAFETY AND COMFORTABLE DRIVING

The Amazing "Ergon Glass Lens" is an integral part of the Polarvision Light. It produces a Black Light (barely visible to the eye) which counteracts oncoming headlights, street lights, etc. without interfering with your visibility. Easy to install above windshield—beautiful accessory. Light encased in high grade chrome holder. Works off car's central lighting circuit. Limited Supply. Complete (including all parts) **\$6.95**

Send cash, check, or money order. Guaranteed Electronic Development Company, Dept. A-11 Los Angeles 34, Calif.

Buy the Best...WISS!



for all sheet
metal cutting

WISS Metal Master Compound Action Snips

#M-3. Easily cuts 18 gauge sheet metal. Cuts curves and circles as well as straight. Ideal for the home workshop. \$4.25. Rubber grips recommended, 60¢ extra.

WISS Straight Cut Snips

#9. Crucible steel inlaid blades. The basic snips for straight metal cutting. Gun metal handles. Overall length 12½". \$5.25.

WISS Combination Snips

#V-13. Solid steel, with gray japanned handles. Cuts curves and irregular shapes with ease. Handy pocket size. 7" long. Accurately tempered jaws and strong bolts. \$1.85.



Prices slightly higher
Denver and West

WISS
NEWARK, N.J.

Quality for more than a Century

J. WISS & SONS CO. • NEWARK 7, N. J.

Arc Welding PAYS BIG PROFITS-

with these **HOBARTS**



Electric Drive DC Welder

Gas Drive DC Welder

Lowest cost

full size welder on market

Cash in on the big demand for dependable arc welding. Set up your own shop now with Hobart and you'll start earning hundreds of dollars of extra profit monthly. Farmers, contractors, factories, builders will keep you mighty busy based on your reputation for low costs and better work.

LET HOBART HELP YOU!

With mechanical ability and a Hobart "Simplified" Welder, you'll soon be turning out top quality jobs and can handle all types of work. They're the same rugged, dependable, economical welders you'll find in America's leading production plants. You'll get such exclusive advantages as 1,000 combinations of welding heat and remote control (at no extra cost) Auxiliary power outlets let you operate lights, tools, etc. Portable models equip you for profitable emergency outside jobs. Check coupon for complete details.

HOBART SCHOOL teaches you quickly!

Earn extra money by knowing how to do all kinds of profitable welding jobs. Learn quickly and easily at low cost in America's most modern welding school... the non-profit Hobart Trade School. Complete or partial courses. Best equipment, thorough training, experienced instructors.

Send today
for these
valuable books

● Procedure & Practice

Complete text and lessons book. Covers every phase of welding. 544 pages, over 600 illus. \$3.00

● Lessons Book

Complete operator's training course. 200 pages, fully illustrated. \$1.00

● Practical Design

Hundreds of profitable welding ideas in design form. 3 vols. of 100 designs each. 1 vol., \$3.50; set of 3, \$10.

*Makes and keeps
chrome factory-bright!*

- REMOVES RUST
- POLISHES CHROME
- PROTECTS CHROME

End-O-Rust kit has everything you need to restore the beauty and keep the chrome on your car factory-bright. Fast... easy to use. No hard rubbing. One application protects chrome against rust and corrosion for complete season. Guaranteed not to discolor. Detergents, salt, dilute acids will not harm or remove protective film. Positively will not harm paint. Thinner removes coating if necessary. Kit contains chrome cleaner, polish, chrome protector, thinner and brush. See your dealer or send \$2.25!

END-O-RUST INC.
1900 Euclid Ave. • Cleveland, Ohio



ONLY
\$2.25
FOR ALL
FOUR

Territories open for Qualified Distributors

*Check Coupon for
Complete Details*

HOBART BROTHERS CO., Box P-111, TROY, OHIO

"One of the world's largest builders of arc welders"

HOBART BROTHERS CO., Box P-111, TROY, OHIO

Send full details on items checked.

☐ Electric Drive Welders ☐ Gas Drive Welders ☐ Hobart Trade School

Send books checked ☐ Proc. & Practice ☐ Practical Design: ☐ Vol. 1 ☐ Vol. 2 ☐ Vol. 3 ☐ set of 3 Vols. ☐ Lessons Book ☐ Cash encl. ☐ C.O.D.

NAME _____

ADDRESS _____

CITY _____ STATE _____

**Free-
new
booklet**



☐ "Guide to Better Welding"

Burden's Gigantic Fall MAIL SALE

Midwest's leading surplus firm offers, subject to prior sale, a \$650,000.00 inventory of new perfect condition:

• **WAR SURPLUS • EXCESS INVENTORY • BANKRUPT STOCKS**

During Sale We Will Pay All Shipping Charges!

Power Plants and Generators

- **Kato Generators.** 115-V, 60-C, 5000-Watt, 1800 R.P.M. Single Phase. Ball bearing. Complete with control panel. Cost over \$550.00.....\$259.50
- **Onan Plants.** 115-V, 60-C, 5000-Watt, 4-cyl. engine, complete control panel. Push button start. Cost over \$1,200.00.....\$715.50
- **Homelite Plants.** 115-V, 60-C, 1500-Watt, 1-cyl. engine. Complete. Exceptionally fine. Cost over \$450.00.....\$258.70
- **Homelite Plants.** 115-V, 400-C, 1400-Watt, 1-cyl. engine. Fine for lights, irons, heaters, but not motors. Cost \$630.00.....\$129.60
- **Burdex-Briggs Plants.** 115-V, 60-C, 2000-Watt, 1-cyl. engine. Excellent size for home emergency power. List \$585.00.....\$297.50
- **Delco-Remy Generators.** 25-30 Volt, 200-amp. Direct current. Makes excellent welder (full instructions for building), also fine for emergency lights, power, etc. Cost over \$250.00.....\$119.95
- **A-C Generators.** 115-V, 800-C, 1 KW.....\$18.96
- **D-C 6-Volt Wind Driven Generator outfit, complete.**.....\$33.95

AIR COMPRESSOR EQUIPMENT

- Paint, blow up tires, clean gas lines with compressed air. Build your own portable hi-pressure unit.
- **Basic Compressor Kit.** Finest 1-cyl. piston comp., stainless steel storage tank, 160 lb. gauge, paint gun, blow gun, fittings, tire chuck, hose, relief valve, inst. for portable unit.....Air Reg. \$45.49
- **Air Components.** 1-cyl. compressor.....\$20.50
- 2 cyl. comp \$49.50. Automatic pressure switches (on 50, off 75).....\$4.95, pressure regulator (0-150 lb.).....\$2.65, gauges (60, 100, 160 lb.).....\$1.89, tanks (small \$5.60, large \$9.95), air hose, 20' 1/4" with fittings.....\$2.89, adj. safety valve.....\$1.95, top quality paint gun, \$8.95, 3-gal. paint tank.....\$18.95

WINCHES, CLUTCHES—ENGINES—BLOCKS

- **Heil Power Winches.** Heavy duty 15,000 lb. with clutch and 150' 1/2" cable. Cost \$275.....\$169.70
- **DeLuxe Hand Winches.** Dual ratio 1-3, 1-9. Finest construction. Powerful 2,000 lb. 100s uses, farm & business.....\$29.87
- **Truck Hand Winches** 1-3 ratio, 1,000 lb. Excellent for loading trucks, Contractors, etc. Top quality.....\$19.89
- **Utility and Boat Winches** 1-4 ratio, 1500 lb. \$19.95
- **Double Sheave Blocks.** All steel for rope, 5", 1". \$7.76
- **Snatch Block.** 4" steel, 3000 lb.....\$5.49

Water Pumps—Water Systems—Weed Spray Units

- **Automatic Pressure Water System.** Leading make. For farms, cabins, etc. 110-volt 60-cy. 300 g.p.h. 22' lift \$69.50
- **Bronze Medium Pressure Rotary Pumps.** Up to 25 lbs. Stainless shaft. Self priming. Lift 10' without foot valve, 22' with. Efficient. 1/2" 6 g.p.m.\$12.95
- 3/4" 10 g.p.m.\$16.95
- 1" 19 g.p.m.\$22.95
- **Bronze High Pressure Rotary Pumps.** Up to 150 lbs. Stainless shaft, self priming. Lift 10' without foot valve, 22' with. Top quality unit. Move 1/2" 5 g.p.m. \$14.50, 3/4" 8 g.p.m. \$20.95, 1" 17 g.p.m. \$27.95
- **Centrifugal Irrigation & Flood Pumps.** Cast iron-bronze, stainless shaft, 7500 gal. per hr. 2" suc, 1 1/4" dis. Ball bearing.....\$34.79
- **All Brass DeLuxe Tractor Weed Spray Outfit.** Popular make at over 40% saving. Consists 4-row brass boom with genuine T-jet 5 g.p. acre, nozzles, easy mount any tractor, gauges, valves, hose, direct drive tractor pump, relief valve, etc. A guaranteed value \$84.50

MISCELLANEOUS CLOSE-OUT EQUIPMENT BARGAINS

- Limited quantities. Order promptly to get in on these.
- **G.E. Dictation Magnetic Recorders.** 110-v, 60-c. For home or office. Records over and over. Brand new with tubes.....\$29.50
- **Rural Magneto Phones.** Wall type. Modern case, 5-bar.....\$12.40
- **Private Magneto Phones.** Wall type. Modern, 3-bar.....\$10.25
- **City Up-Right Desk Phones.** Many uses. Instructions.....\$1.99
- **Motor-Gyro Units.** 24-v, D-C (will run on A-C) fascinating \$1.98
- **Direct Reading Tachometers.** 0 to 4000 R.P.M. Leading make \$6.79
- **G.E. Arc Welders.** Complete outfits, 220-v, A-C.....\$139.50
- **G. E. FARM SHOP A-C WELDER.** Late model, Brand new. Complete with all accessories and rod. Continuous Current Control. Up to 150 amp.—220 volt operation. \$160 Value.....\$139.50

GUY CABLE-TURNBUCKLE UNITS

12 ft. flexible steel cable, 14" turnbuckle. Fine for guying television antennas, strengthening gates, bldgs., etc. cost \$1.10 10 for\$3.89

WIND DRIVEN POWER PLANTS

Ideal for lights, radio, battery charging. Fine for remote camps, farms, etc. Complete, 6-volt, 30 amp., D-C generator, 7-ft. propeller, relays, 6-ft. steel tower, etc. Brand new. Original cost \$95. SALE...\$33.95

BURDEN'S 30-Year Policy: • Everything guaranteed perfect. • We pay all shipping charges in U.S.A.

ORDER FROM AD or Write for Free Catalog!

BURDEN SALES COMPANY

821 "O" ST.

LINCOLN, NEBR.

GIVE THESE FOR CHRISTMAS AIR PISTOL



Straight-shooting, hard-hitting target pistol that looks and hefts like an army .45. Wonderful for the woods or rumpus room. Makes any basement or yard a target range. Caliber .177, shoots BB's, darts, and pellets. Muzzle loads, cocks like real weapon. Complete with assortment of ammunition. Guaranteed! Sharpen your eye and amaze your friends. Payment in full must accompany pistol orders. Each.....\$5.95

EXTRA AMMO AVAILABLE:

Darts, Doz. 50c; BB's, 150 15c; Pellets, 500 \$1.50

GIANT BALLOONS



Neoprene: Surplus Govt. Weather and Target Balloons. Terrific attention getters for Lodges, Civic Events, School Functions, Conventions, Exhibitions, Trade Shows. Advertise your special events in the Hollywood manner. Make any occasion a success. Great back-yard fun. Marvelous for parties, dances, fairs, picnics, all festivities.

3 Ft. Dia. 39c 6 Ft. Dia. 79c 13 Ft. Dia. \$1.39

SPRINGFIELD RIFLE STOCKS Straight-away model... \$1.95

As pictured above. With modified Pistol Grip. Genuine Army Surplus rifle stocks. New, untreated, straight-grained, solid walnut, free of cosmoline. All perfect. No warpage. A \$40 value. You'll never find a better bargain. \$3.95

Limited Supply Other Rifle Stocks, Same Quality & Perfection, Army Surplus

Army Carbine.....\$1.95 Also: Enfield Hardwood Paratroop Carbine.....\$5.95 Stocks.....\$3.95 We Pay postage on prepaid orders. Calif. Res. add sales tax.

WAR ASSETS DIV.

VOLUME SALES CO.

Dept. S-11-51, 3930 Sunset Blvd., Los Angeles 29, Calif.

NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25c



Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2131 Columbia Avenue, Rockford, Illinois.

NONE BETTER!

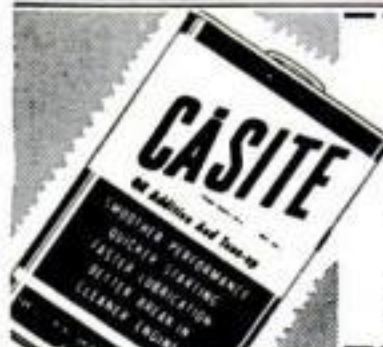
SUPER DRILL GRINDER



Sharpens round shank drills from 3/32" to 1/2" in diameter, up to 6" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only \$2.95 At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. S-11, Los Angeles 44, Calif.



Guaranteed Better and Smoother Performance all Year Round • Quick Starting in Coldest Weather or Double-Your-Money-Back

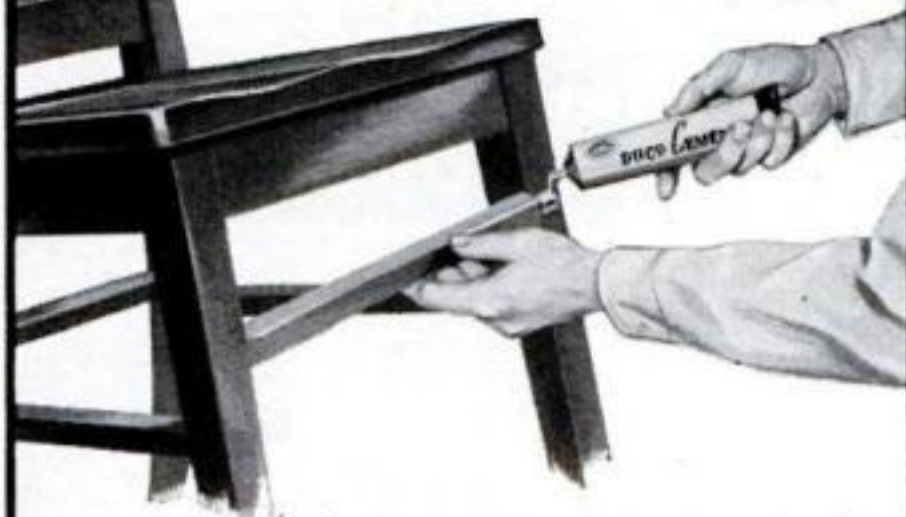
ALNICO MAGNETS LIFT 175-lb.

AMAZING PERMANENT MAGNETS—WILL NOT WEAKEN! NON-ELECTRIC. Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from floor sweepings. Clear alley of harmful tacks, nails. Many other uses listed. Pays for itself quickly. GUARANTEED: Try any magnet one week. Money refunded if you are not well-pleased. Cat. No. 675 (Has a pull of 175 lbs. on a flat steel block).....\$10.50 Cat. No. 650 (150 lb. pull) \$8.50. Cat. No. 550 (50 lb. pull) \$4.00 Cat. No. 530 (30 lb. pull) \$3.00. Cat. No. 30—Hobbyist assortment of six medium magnets...\$1.50 Send M. O. or check. We pay postage. MIAMI MAGNET CO.

3240 N.W. 27th Ave., Aviation Bldg. No. 43, Miami, Florida

REPAIRS

Furniture, Toys,
Luggage, Dishes



It's transparent, waterproof,
flexible and durable.
Get a tube
today.



DUPONT

DUCO CEMENT

REG. U. S. PAT. OFF.

For Better Work — FASTER — EASIER

THE ZEPHYR Electric Drill



only \$17⁹⁵

DRILL STANDS Add Many
Uses for Zephyr Drill



Horizontal
Drill Stand—
for Polishing,
Buffing,
Grinding, etc.

Price \$1.00

Adjustable
Vertical
Drill
Stand—
for drill press
operations
Price \$10.95



Handy . . . Speedy . . . Pow-
erful. Has many uses around
the home . . . in the shop . . .
on the farm. Built to Last.
Full 1/4" Capacity.



De Luxe
Electric Work
Saver Kit

Includes above ZEPHYR
Drill, plus 28 accessories for
buffing, cleaning, drilling,
grinding, mixing paint, pol-
ishing, sanding, sharpening,
waxing, and wire brushing.

Price \$26.35

At Hardware, Implement, and Building Materials Dealers,
and Department Stores—or Write Direct



PORTABLE ELECTRIC TOOLS, INC.

326 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd., 369 Danforth Rd., Toronto 13, Ont.

ATKINS



for

**BEST BRAND
BEST CRAFTSMEN**

● Anyone who saws should see these
fine tools! From tip to grip they are
"Silver Steel" quality through and
through. And that means best quality
—best value, most for your money!



ATKINS No. 400

First choice of experienced craftsmen! Balanced
blade, teeth fitted for fast cutting. Segment ground
for easy clearance. Hardened and tempered to stay
sharp longer. "Perfection pattern" handle elimi-
nates wrist strain. Ship point.



ATKINS MECHANIC-KUT Circular Saws

Fast, smooth cutting without slivering or
feathering! Extremely accurate. 6" to 10"
diameters. Rip, cut-off or combination.



ATKINS No. 36—Nest of Saws

Molded pistol grip Tenite handle.
Hardened and tempered blades
—compass, keyhole and nail-
cutting. Slotted for 3 cutting
angles.



ATKINS No. 37 Compass Saw

New design Tenite utility grip.
17 x 18 gauge blade—8 points
per inch. For extra heavy, inter-
changeable blade, ask for
Atkins No. 38.

Use—Don't Abuse—Fine Tools!



E. C. ATKINS AND COMPANY

Home Office and Factory:

402 S. Illinois St., Indianapolis 9, Indiana

Branch Factory: Portland, Oregon

Knife Factory: Lancaster, New York

Sales Offices: Chicago • Portland • New York

GET THE WORLD'S LEADING

RADIO & TV CATALOG

★
FREE

★
1952
212-Page
Edition

★
ALLIED'S
BIG COMPLETE
BUYING GUIDE

Save on Everything
in Radio and TV



NEW
UP-TO-DATE
SEND FOR IT NOW

**Everything for Experimenters,
Builders, Amateurs, Service-
men, Engineers and Soundmen**

Send for ALLIED'S 212-page 1952 Catalog, the value-packed guide to *everything* in Radio and Television! Latest home radios, TV equipment, Amateur supplies, P.A. Systems, Hi-Fidelity Sound, recorders, test instruments, builders' kits—plus the world's largest stocks of electronic parts, tubes, tools, books and diagrams. Get more for your money—send today for your **FREE 1952 ALLIED Catalog!**

**Get Radio's Leading
Buying Guide Today**

FREE!

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-LL-1
833 W. Jackson Blvd., Chicago 7, Ill.

☐ Rush FREE 1952 ALLIED 212-Page Catalog.

Name _____

Address _____

City _____ Zone _____ State _____



C2

COLORCRETE

Lifetime beauty comes out of a gun! Colorcrete is a cementitious plastic, applied by pneumatic pressure to new or old concrete stucco, etc. Tough, tenacious, enduring. Can be washed or scrubbed. Dirty, drab surfaces become sparkling white or tinted from a range of 30 colors.

"Building-Beautifying" —Your Big Opportunity

Colorcreting is a fascinating and profitable opportunity for men who want to build a substantial, long-term business. Colorcreting is exclusive. Rich in sales appeal to building owners. Income potentials are high; investment is low. We supply complete equipment, full instructions and liberal cooperation. Requires no previous experience or special ability. Write or wire for the Opportunity Book today. Be the first in your community.

COLORCRETE INDUSTRIES, INC.
572 Ottawa Ave., Holland, Mich.



NEW! CHEAP! **OIL BURNER** SWEEPING THE COUNTRY!



**SALESMEN
BIG MONEY**

SLIPS INTO ANY COAL
RANGE, STOVE OR FURNACE

Amazing quick, intense heat. By finger-tip control. Cheaper than coal. No more shoveling coal or ashes. **SENT ON TRIAL.** Prove it pays for itself quickly by what it saves. Big bonus for testing. We'll let you try one in your own home for one month. Write for details today. **NORTHWEST MFG. CO., 361-N Main, Mitchell, S. Dak.**



BULL HACKSAW

**POWERFUL!
PORTABLE!
POCKET-SIZE!
\$4.95**

for any 1/4" electric drill or drill press
Easy to carry, easy to use—a "must" for every home craftsman! Full chip clearance on any wood, metal or plastic stock up to 3/4". No gears, no bearings, nothing to wear out. Weight: 11 ozs. Guaranteed and only \$4.95!

Send Cash, Check or M. O. Today!

BERTRUM R. ENGINEERING AND SUPPLY CO.
3125 Harrison St. Kansas City, Mo.

1/2" ELECTRIC DRILL \$2.95

ADAPTER takes all drill sizes to 1/2"

Fits any small 1/4" Electric Drill—
in just a second! Well-made
and a Mighty Handy Tool

DANIELS PRODUCTS CO. P-11-822 W. 22nd St., Kearney, Nebr.



Postpaid
in U.S.A.

Order Now



**BUILD
YOUR OWN
MACHINE TOOLS
CASTINGS-DRAWINGS**

Catalog with complete construction drawings of this 7 inch bench lathe with plain slide rest, 25 cents postpaid, or send one dollar for drawings of three lathes, three milling machines and six inch crank shaper. Refund on castings order. **POOTATUCK CORPORATION, 104 Sammis Pl., Stratford, Conn.**

CLEAN PAINT BRUSHES

in Minutes with NEW

Kwikkeeze

- SOFTENS hardest brushes—usually less than 30 minutes.
- CLEANS OUT fresh paint instantly!
- DISSOLVES all paint finishes easily.
- HARMLESS to hands and brushes.

Pint Can only 59c
CLEANS SEVERAL
BRUSHES

For
Free
Circular
Write

SAVOGRAN

25 HUNTINGTON AVENUE, DEPT. 30, BOSTON 16, MASS.



WEATHER-PROOF YOUR CAR...

LIKE THE NEW

CADILLAC, FORD, HUDSON, CHRYSLER, Etc.

Drive thru rain, snow, puddles, protected by SEALTIGHTS—the original ignition weather-proofing insulators.

SEALTIGHT IGNITION INSULATORS

AMERICA'S FINEST INSULATORS!

Weatherproof, short-proof all cars, trucks, tractors, gas motors with Sealtights on spark plugs, distributor, coil, magneto. ASK YOUR GARAGE or SERVICE STATION, or write us for details, giving make and model of car.

SEALTIGHT CORP., Dept. PS111, Cedar Rapids, Iowa



CUT ACCURATE ANGLES EVERY TIME!

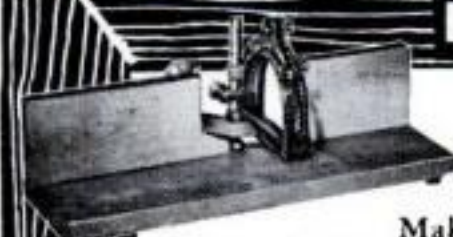
EASY WITH NEW HEMPE MITRE BOX

Makes accurate cuts with ANY hand or back saw. 3-bearing saw guide, adjusts instantly, locks to any angle. Quadrant indexed, for 4, 5, 6, 8, and 20-sided figures. Stores saw out of way. Close tolerance hardwood base with non-slip rubber feet. Buy the Hempe No. 3618 Mitre Box Today at your dealer.

Or order direct... ONLY \$8.00 postpaid

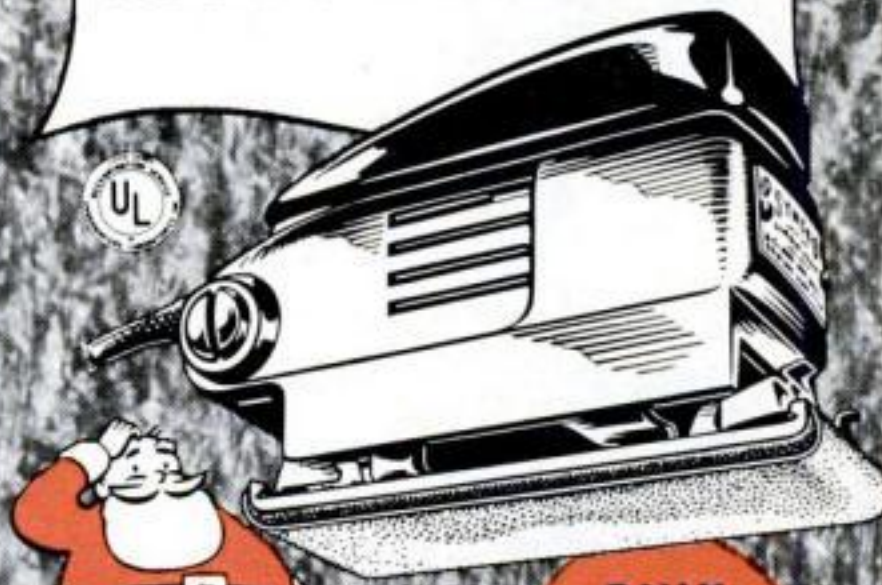
HEMPE MFG. CO., DEPT. S.,

1301 Glenview Pl., Milwaukee 13, Wis.



UNUSUAL!

THIS AD BACKGROUND IS MADE FROM AN UNRETOUCHED PHOTO OF SYNCRO SANDED WORK MAGNIFIED 14 TIMES... SHOWS HOW SYNCRO SANDER'S EXCLUSIVE DOUBLE ARC MOTION DOES A PERFECT SANDING FINISHING JOB. IT COMBINES THE BEST PARTS OF ORBITAL AND STRAIGHT-LINE MOTIONS!



NOW SEE how ribbed and coarse work looks after straight-line motion... 14 times magnified. From unretouched photograph.



ONLY
\$19.95
MOTOR
INCLUDED

SYNCRO POWER UNITS
GUARANTEED
AGAINST BURN-OUT DURING
YOUR OWNERSHIP OR
REPLACED FREE!

DOUBLE ARC MOTION Doubles the Sanding Action

The amazing new SYNCRO NO. 504 now has DOUBLE its previous sanding action—gives a scar-free, BETTER, smoother finish—twice as fast! Finer finish guaranteed or money back! Simply wonderful for finishing fine furniture... ideal for overhead sanding... perfect for window sills, any hard-to-sand place. Get yours now. COMPLETE with New BUILT-IN Reactance Type Electric Motor, \$19.95 at dealers or direct. Operates 60 cycle, 110-120 volt AC. (Dealers, Jobbers write!)

SYNCRO ELECTRIC SANDER

World's largest manufacturer of reciprocating electric sanders with double arc motion which gives double the sanding action.

SYNCRO CORP., Dept. G-111A, Oxford, Michigan, U.S.A.

☐ ORDER. I enclose \$19.95. Send No. 504 Sander postpaid on 10 Day Money Back Trial.

☐ FREE CIRCULAR. Send new SYNCRO CIRCULAR showing amazing new JIG SAW and amazing new SANDER!

WRITE NAME, ADDRESS BELOW—MAIL TODAY!



Last Year's Profit \$3,000!



with a

FOLEY automatic SAW FILER

"Last year's profit amounted to \$3,000. Not so bad for a one-man outfit"—from Chas. C. Hough. James B. Williams wrote us—"I made \$765 last year filing saws, and it sure comes in handy. I do this work in my spare time." Men in communities of all sizes make up to \$2 or \$3 an hour with the Foley Saw Filer working full time or part time. That extra money comes in mighty handy in these days of high prices.

It's no trick to take care of the saw filing for your neighborhood hardware or lumber dealer—plus looking after the saws for farmers, townspeople, manual training departments and factories. The Foley files all hand saws, also band and cross-cut circular saws. It's a cash business, no canvassing, no eyestrain and no experience needed.

FREE BOOK SHOWS HOW TO START

"INDEPENDENCE AFTER 40" shows just how you can start at home in your spare time working in your basement or garage. It's an immediate cash business that can develop into a full-time repair shop. Send coupon today—no salesmen will call.



Send For **FREE BOOK**

**FOLEY MFG. CO., 1119-1 Foley Bldg.
Minneapolis 18, Minn.**

Send me free book "INDEPENDENCE AFTER 40!"

Name.....

Address.....

HOBBYISTS get This \$6.95 SENSATIONAL ARBOR

TOOL SET A VALUE OF \$30.00—MONEY REFUND-
ED IF NOT COMPLETELY SATISFIED.

First quality—3/32" and 1/8" Shanks—About 150 pieces



The greatest value we have ever offered in our 15 years in business. Only possible because we bought out a factory of their complete line of burrs. If the tools were bought separately in Hobby shops, you would pay more than \$30 at the regular

prices. The tools include burrs, saws, drills, routers, carvers, emery discs, reamers, borers, shapers, grinding points.

Will fit any hand tools such as Dremel, Kasco, Handy, etc. This is a real super value that you cannot afford to miss—Buy several sets.

SENSATIONAL LOW PRICE \$3.50 GENUINE DIAMOND DRILLS



Your choice of the above six styles at \$3.50 each Parcel Post Prepaid or \$19.50 for the complete set of 6. These are \$6.50 to \$12.00 values. We bought out a manufacturer's complete stock and can pass this tremendous savings on to you.

These are as fine as you can get. Your money refunded if not completely satisfied. Order by number. Send check or Money Order to Dept. P. S.

GENERAL AIRE CO.

447 W. Norris St.

Phila. 22, Pa.

FANS! FANS! ALL TYPES — ALL SIZES

Kitchen Ventilators, Exhaust Fans, Attic Fans, Blowers, Heat Boosters, \$7.95 up, Desk Fans, Window Fans, Blades, Guards, Shutters, Motors, etc.
Free illustrated catalogue, dealers inquiries invited

EDWARDS BROS. ESTAB. 20 YEARS
WESTERN APPLIANCE CO., INC.
5650 Grand River Ave., Dept. F, Detroit 8, Mich.



JUST OUT!



1952 EDITION

It's New! It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts & accessories for all cars & trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. (100 pages) Send 25c (refundable).

J. C. WHITNEY,

1917-F Archer,

Chicago 16

SHEET METAL BRAKES

Forms angles, flanges and Pittsburgh locks. 26 gauge steel, heavier aluminum. Cam locking. Portable, can be bolted to bench, or clamped to edge of truck. All steel, reinforced. Shipped Exp. Coll. 30" size, Wt. 54 lbs., \$26.50. 36", Wt. 66 lbs. \$31.00. 48", Wt. 100 lbs., \$45.00. Floor mountings, portable, 32" high, 30 lbs., \$7.00. 12" BRAKE. Fits in vise to form difficult compound bends, up to 20 gauge steel. Not illustrated..... \$12.50 P.P.

HYDRAULIC PRESS BRAKE forms 1/4x4, or 1/4x2-in. 3/4" Pipe Bender and Bar Bender and Straightener up to 1/2" thick. Uses your 5 ton jack, \$18.50.

24" CURVE FORMER, 2 roll, 16 gauge, 2" to 2' dia., \$10.00 P.P.
IRON BENDER, 1/4x2" capacity, 10 parts. All steel.... \$10.00 P.P.

Immediate delivery. Order direct, cash or C.O.D. or send for folder.

VYKE BRAKE CO., S-1116 So. 27th St., Omaha 5, Nebr.



HOME PLANS THAT SAVE YOU MONEY

New popular Home Plan Books showing actual photos or color pictures (and floor plans) of over 233 popular sizes and styles of homes. Working drawings, material lists, specifications available for each plan—AT LOW COST. Order your books today.

Choice Selected Homes.....50c
Over 75 designs, 32 in color.
Ranch and Suburban.....50c
158 designs, town and country.

Both Books Postpaid \$1.00 2 to 4 bedroom sizes.

America's Pioneer Residential Plan Service

L. F. GARLINGHOUSE CO., INC., Box PS-12 TOPEKA, KANSAS

GET THIS "How to do it" BOOK FREE!



PARTIAL LIST OF CONTENTS

"Better Painting"
"Refinishing Antiques"
"A Superb Furniture
Polish"
"Protecting Tools"
"Waterproofing"
"Finishing Gun Stocks"



Here are 101 useful ways to use America's finest 100% pure linseed oil. Perfect for painting and the handiest item for every housewife, homeowner and farmer. Available at all stores.

EARN \$2.00 EASY

We will pay \$2.00 for each new practical idea for using Pol-mer-ik Linseed Oil, which is acceptable to our research laboratory. Write Archer Daniels Midland, 604 Roanoke Bldg., Minneapolis, Minnesota.



REPLACEMENT OR REFUND OF MONEY
Guaranteed by
Good Housekeeping
IF NOT AS ADVERTISED THEREIN

ARCHER
Pol-mer-ik
100% PURE LINSEED OIL



\$500,000.00 INVENTORY for
QUICK LIQUIDATION

Surplus items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

PAGE AFTER PAGE OF VALUES

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10c to cover postage, mailing, etc. Write today!

SEND TODAY FOR YOUR COPY

STARK'S

509 So. State St.
Dept. PS-11
CHICAGO 5, ILL.

10c

MODERN LAWN MOWER SHARPENER

FOR LAWN MOWER SHOPS
FIX-IT SHOPS
GOLF COURSES • PARKS
101 OTHER JOBS

Sharpens All Reel Type Mowers •
Hand, Power or Gang • 10 to 20
Minutes • No Dismantling • No
Extra Attachments Needed.

All reel type mowers, from 3-inch
edgers to 36-inch power mowers,
are quickly sharpened to extreme
ends of both left and right twist
blades. Handle, wheels, roller and motor re-

main in place when sharpening
is in process. Bed knife is
sharpened in same brackets.
Grinding head rides on five ball
bearing races. Easy to operate.
Also sharpens chisels, joiner
knives, planer blades. Big profit maker. Own your own
business. Send Today for **FREE Illustrated Bulletin**
No. 11-C1. Prices Subject to Change Without Notice.



PRICE
\$241⁵⁰
less motor

\$263⁰⁰
with motor

ORDER
NOW
Immediate
Delivery

MODERN MFG. CO. 160 N. FAIR OAKS AVE
PASADENA, CALIFORNIA



**NOW 40 DIFFERENT
CUTS ON YOUR SAW!**



WITH

Warren
DADO SAWING WASHERS

Cut clean, accurate, parallel
grooves—40 widths, any
angle. No chatter, burning,
chewing—or sanding! No
more blade vibration—no
screws to fuss with—just four
balanced washers. Simply dial
desired width with Micro-
matic adjustment. Can be left
on blade for straight cuts.
Available in 4 sizes— $\frac{1}{2}$ ",
 $\frac{3}{4}$ ", $\frac{5}{8}$ ", 1". A perfect gift for
woodworkers. See your dealer
or write—

\$4⁹⁵
SET

WARREN WASHERS CO.
Dept. 51 • 70 Medbury • Detroit 2, Mich.

Save \$45.05

BUY
SUPER SHOP
DIRECT

EASY
PAY
PLAN

8" TILTING
TABLE SAW

GRINDER

SANDER

30" LATHE

HORIZONTAL
DRILL PRESS

Compare SUPERSHOP

5 POWER TOOLS IN 1
Complete Home Workshop

Buy SUPERSHOP direct from factory and save. Lifetime lubricated ball bearings. Precision-built. RUGGED. Handles BIG jobs. Complete line of accessories available. 15 day FREE trial. Money back guarantee. Mail postcard for FREE CATALOG.

RETAIL PRICE \$125.00
FACTORY TO YOU

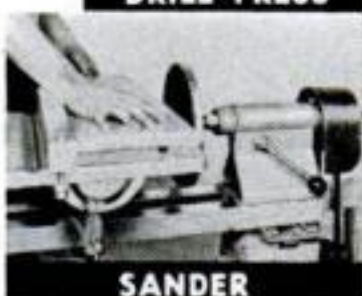
\$79.95

POWER TOOLS INC.

229 YATES AVENUE
BELOIT, WISCONSIN



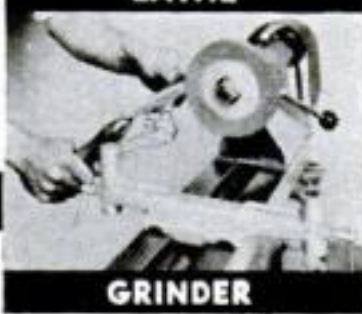
DRILL PRESS



SANDER



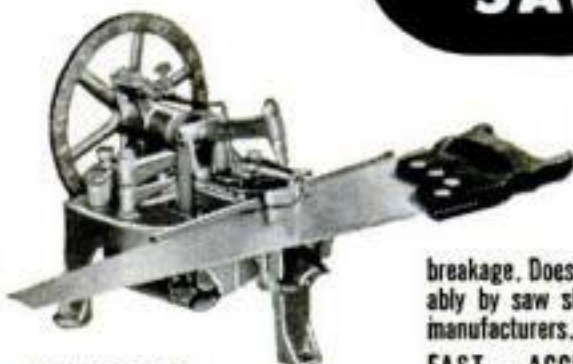
LATHE



GRINDER

BeMaCo Dependable

AUTOMATIC SAW SET



Sets 400 teeth per minute on hand or band saws 4 to 16 point. Hammer and anvil action sets teeth accurately and uniformly... No tooth breakage. Does a perfect job. Used profitably by saw shops everywhere and saw manufacturers. Every machine guaranteed!

FAST - ACCURATE - DEPENDABLE

★ INCREASES
PROFITS

BEAVER MFG. CO.

SAW MACHINE DIV. 9-A
800 SOUTH ISIS AVE. • INGLEWOOD, CALIF.

LOCKS
TURNS
PULLS
HOLDS
CUTS

DOES 1000's of JOBS —

The Easy Way



WISE-GRIP
WRENCH



Low As
\$1.85

No matter what the job is you'll find a use for VISE-GRIP and its powerful LOCKED grip. No job is too tough!

TON-GRIP quickly turns rusted nuts, screws, broken bolts. Pulls headless nails — Clamps parts for soldering, sawing, etc. Easily adjusts to ratchet action. With Cutter: No. 7W, 7", \$2.25; No. 10W, 10", \$2.60. Without Cutter: No. 7C, 7", \$1.95; No. 10C, 10", \$2.25. No. 7, 7", \$1.85; No. 10, 10", \$2.15. Order From Your Dealer.

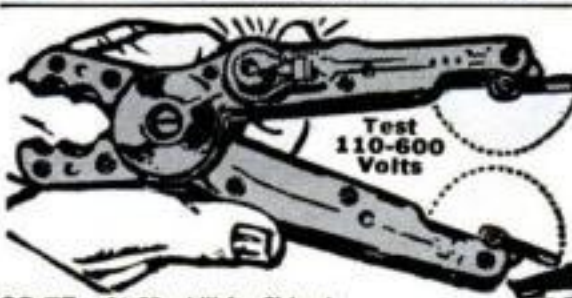
PETERSEN MFG. CO., Dept. M-11, DeWitt, Nebr.

ONE-MAN SAWMILL LOW \$50.00 DOWN



Take BELSAW Portable Sawmill right to the trees—turn out valuable lumber for local yards—do "custom sawing" for neighbors. BELSAW lasts a lifetime. No crew needed. Power with old auto engine. Beginners get excellent results. Send postcard for FREE BOOK, "How To Make Lumber."

BELSAW MACHINERY CO.
8463 Field Bldg. Kansas City 2, Mo.



TEST Circuits, Fuses, Outlets easily, quickly, safely. Shockproof. Pull fuses 10 to 100 Amp.

**STAR*
TEST-PLIERS**

\$2.75 \$1.50 add'l for 2' leads

At Dealers . . . or from us POSTPAID.

STAR FUSE CO., 237 Canal St., New York 13, N. Y.



SAVE TIME WORK MONEY

**SHAW
DU-ALL**

FOR FARM OR
GARDEN
WALKING OR
RIDING TYPE

These rugged walking or riding tractors are ideal for farm, truck garden. FREE illustrated catalog giving complete details, price lists—write today.

**SHAW
MFG. CO.**

5711 Front St., Galesburg, Kans.
668PS North 4th St., Columbus, O.

WELD
BRAZE, SOLDER,
and CUT →

ONLY
\$14.75
F.O.B.
complete!

No experience needed. Follow simple instructions, weld on iron, steel, bronze, brass, aluminum, and other metals. Plugs into any properly wired 110 volt A.C. or D.C. line. Make or save time and money doing repair work for yourself and others. Repair men, farmers, tinsmiths, home and auto owners, hobbyists, etc., say FOUR-WAY pays for itself over and over. Order today or send for Free details.

FOUR-WAY WELDER COMPANY, Dept. F3-MB
2326 So. Michigan Ave. • Chicago 16, Illinois



**ORDER
NOW
10 DAY
TRIAL**

AMAZING TOOL BARGAINS!

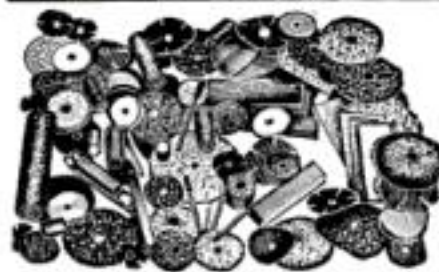
ALL BRAND NEW MERCHANDISE

12 MINIATURE CUTTERS \$1.00



For Cutting Wood, Plastic or Metal. Actual size. Asst. shapes on 3/32" shank. For die makers, home workshop, etc.

Post Paid in U.S.A.



SURPRISE VALUE

100 Pieces \$1.00

FOR ELECTRIC GRINDERS
Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Sharpening and Honing Stones, Rotary Cutting Burs, Abrasive Cartridges, Mandrels, and many other items.

Post-paid in U.S.A.

12 MOUNTED WHEELS

and points on 1/4" Mandrel. For grinding on plastic.



\$2.95

wood, soft and hard metals. Reg. \$8.40 List Val.

12 wheels on 1/4" Mandrel

\$3.60

12 mounted points on 3/32" mandrel \$2.50

FLEXIBLE SHAFT — ONLY \$4.95



35 3/4" long. Oilite bearings. Core of specially wound, high carbon steel wire in flexible steel casing. Will accommodate tool shafts up to 1/4" dia. For lathes, electric drills, etc.

P.P.



2 DRUM SANDERS \$1.50

With 12 Bands in Assorted Grits. 1/2" dia. x 1" long on 1/8" arbor with 12 bands

ONE DRUM 1" DIA. x 1" LONG ON 1/4" ARBOR WITH 6 EXTRA SLEEVES \$1.00

P.P. in U.S.A.

SCHUPACK SUPPLY CO., 7331 Cottage Grove, Dept. S-111, Chicago 19, Ill. (Illustrated Catalog 10c)

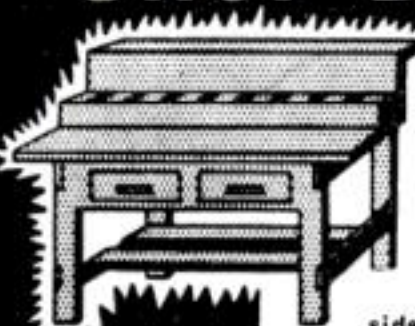
Get Your Share of PROFITS with the IDEAL



THE IDEAL MODEL 300—a sensational new lawnmower sharpener—starts you on the road to big profits! Accurate, rugged, precision built, easy to operate, backed by 50 years' experience. Write today for complete information.

THE FATE-ROOT HEATH-COMPANY
Dept. O-4 PLYMOUTH, OHIO

SHOP BENCH



FOR HOBBYIST OR CRAFTSMAN

IDEAL XMAS GIFT

Bench is constructed of selected seasoned lumber with heavy well sanded 2" top. 2 large side guided drawers, tool racks, bins for nails & bolts, large sturdy shelf 59" x 22" x 36" high. Very sturdy construction. Shipped unassembled. Precision machined for simple & accurate assembly from directions. Hardware incl. Mail check, M. O. today for prompt delivery, shipment.

\$23.50

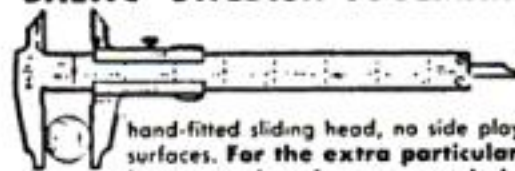
F.O.B. Warrensburg

MONEY BACK GUARANTEE

M. MARCINOWSKI, Dept. P
BOX 462, WARRENSBURG, N. Y.

WAR SURPLUS AND OTHER BARGAINS

"BALTIC" SWEDISH TOOLMAKERS VERNIER CALIPER



ULTRA PRECISION—0.6" in 001 graduations. Quick, accurate depth, inside and outside measurements, fine engraving. Extra heavy rule, hand-fitted sliding head, no side play. Rockwell C-60, lapped measuring surfaces. For the extra particular mechanic who must have the best—used and recommended by most critical experimental and research machinists at Lockheed • Douglas • Bendix • GM • RCA • General Electric. Save 50%! A \$37.50 value—only \$17.25—Leather case incl. Also a standard grade Mauser Design Caliper • made in Germany • For the production machinist, 0-6" in thousandths, the most accurate caliper of this type on the market, thousands of satisfied users—only \$12.95—Leather case included.

These are both guaranteed buys. Your money back if not entirely satisfied. Order now!

LOW VOLTAGE CIRCUIT TESTER

Made for U.S. Ordnance Dept. to rigid specifications. Portable steel hand carrying unit checks generator, battery circuit, current and voltage regulators. A terrific testing unit for garages, mechanics, truck fleet owners, boat and marine mechanics. Can be used on any 6 or 12 volt system. Govt. cost approx. \$175.00. NEW—complete with book of instructions. \$32.50. Shipping weight 20 lbs.



POCKET-PACK PRECISION WRENCHES



First quality chrome-molybdenum steel, heat treated, hardened. Broached to close tolerances. Open end and twelve point box for double use and value. NEW—complete with plastic case—\$1.75 ea. complete. POSTPAID in U.S.A.

MAGNETIC BASE INDICATOR HOLDER

Available with adapter bushings for all types dial indicators, with guaranteed lifetime Alnico magnets. Vee-slotted base has 45 to 50 lbs. pull without special attachments.



NEW—\$3.50

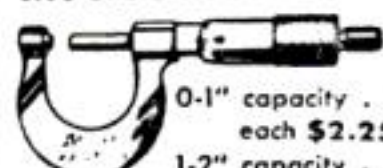
AIRCRAFT COCKPIT LAMP ASSEMBLY



6 ft. extension rubber-coated cord, with ratchet locking spool device. A.C. or D.C. current from 6 to 110 Volts. Ideal for home or car use.

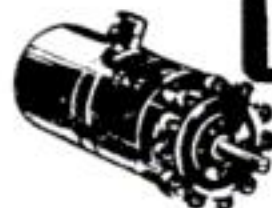
Price \$3.50

MICROMETERS



0-1" capacity . . . each \$2.25
1-2" capacity . . . each \$3.50

Chrome plated, precision engineered and carefully tooled to give long life. All new.



PI GENERATORS

Direct current generators for welders, plating, truck and marine use, D.C. appliances, etc. Aircraft quality, heavy duty. Rating 200 amps—28 volts at 2500 R.P.M. Govt. cost \$300.00. Weight 70 lbs. NEW—\$21.50

CANNED HEAT

Each can generates enough heat to cook from 3 to 6 meals. Great for sportsmen, picnickers and emergency heating of all types. Packed 12 cans to the case—6 ea. 2 oz. and 6 ea. 4 oz.

NEW—@ \$1.50 case



Send check, money order or cash. 25% deposit required on COD orders. All prices FOB Culver City, California, unless otherwise stated.

Send 25c for New 1951 Illustrated Catalog.

AIRBORNE SALES CO., INC. DEPT. PSM-11-51
CULVER CITY, CALIF.

EVERY ELECTRIC DRILL A PORTABLE SAW

AT
BETTER
HARDWARE
STORES
EVERYWHERE

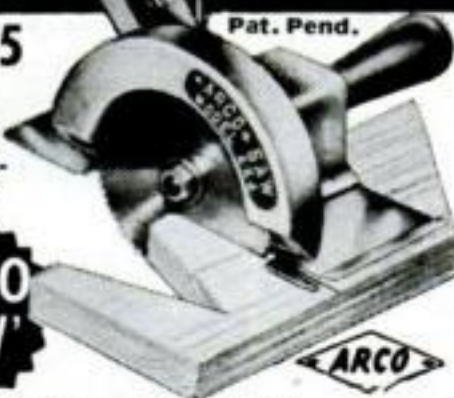
JOIN THE THOUSANDS who
SAVE WORK — SAVE TIME
and do the job BETTER with

"ARCO-SAW" (Over 100,000 Sold)

9.95

No. 444
"ARCO-SAW"

ARCO
SAW



Pat. Pend.

CAN BE USED
WITH ONE HAND!
Any 1/4" or 3/8"
Drill a Powerful
Saw in ONE
MINUTE

"ARCO-SAW" is
a rugged tool with
right angle gear
drive (no clumsy,
dangerous, direct
drive with drill
sideways). Works
like a high priced
Portable Saw.

CUTS 1-5/16", or 2x4 by turning over

ONLY ARCO GIVES YOU ALL THESE FEATURES: Safety-yoke
assures rigid connection and absolute safety—Visual guide
and wide shoe-plate for straight, square cuts—Big handle af-
fords firm grip for two-hand operation—Precision one-piece
gear box—Self-lubricating lifetime bearings.

NOW AVAILABLE! No. 445 "ARCO-SAW"
11.50 for DEPTH & BEVEL CUTS



Has all Features Listed Above Plus:
Depth gage with graduated adjust-
ment from 0 to 1 1/4" depth (for
grooves, dados, scoring). Bevel
gage with graduated adjustment
from 0 to 45° bevel (for dovetails,
bevels). Rip gage with sideways
adjustment (for accurate width
molding, strips). Visual guide with
adjustment to follow lines on both
straight and bevel cutting.

NO. 444 "ARCO-SAW," complete with 4-inch
"HYCARBON" CROSSCUT BLADE (less drill) \$9.95
NO. 445 "ARCO-SAW," complete with Depth-Bevel-Rip Gage
and 4-inch ARCO "HYCARBON"
CROSSCUT BLADE (less drill) \$11.50
NO. 444G DEPTH-BEVEL-RIP GAGE. Easily attaches
to any No. 444 "ARCO-SAW" to convert it to a \$1.95
No. 445 "ARCO-SAW"
"HYCARBON" REPLACEMENT BLADES—4-inch
Crosscut or 4-inch Combination \$2.00

90-DAY FACTORY GUARANTEE

ORDER TODAY at your dealer or send us check or M.O. (Post-
paid.) C.O.D.'s, postage extra. Ask for literature of other tools.

UNCONDITIONAL 10-DAY
MONEY BACK GUARANTEE

DEALERS—Write for
nearest jobber.

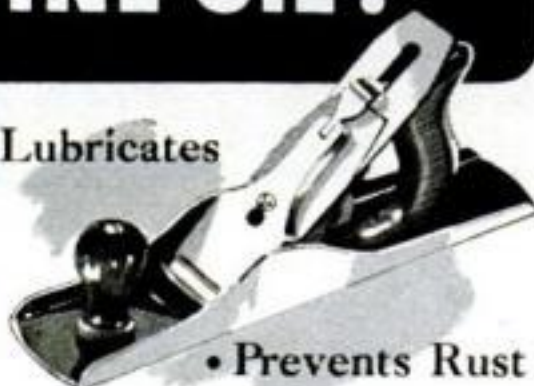
ARROW METAL PRODUCTS CO.

DEPT. PS-11, 140 WEST BROADWAY, NEW YORK 13, N. Y.

FINE TOOLS NEED FINE OIL!



• Lubricates



• Prevents Rust

• Cleans • Polishes

SOLD EVERYWHERE

3-IN-ONE Oil

NEW!



Electric
Drill
PLANE
CONVERTER

Fast • Accurate
Speed Planing

• Beveling
• Ripping

NOW! Convert your 1/4" electric drill for fast, accurate
planing, beveling, ripping, in a matter of minutes.
Rips up to 1 1/4" strip, planes 1/4" at one stroke,
15 times faster than any hand plane. Rips boards up
to 1 3/4" thick. Nothing like it exists. Too many uses to
mention. Order completely assembled or ready-to-
assemble, all parts and instructions furnished. You need
only 14" piece of 2x4 and your own electric drill.
2 planing blades made of finest High Speed steel
available included. Blades are 1/4" diameter, 2" cutting
surface. Saves you \$50 to \$140! Send cash, check, or
money order. Shipped same day. Use for 10 days.
If not satisfied return. Money-back guarantee. Parts
ready to assemble \$9.95.

Completely Assembled

\$14.95

Electric drill not included

International
Twist Drill Corp.
7th & Wyandotte, Room 692
Kansas City 6, Mo



GARBAGE DISPOSAL USERS!! Stop costly repair bills!

Amazing new precision-made tool designed to free
jammed garbage disposals in an instant. Fits all types.
All-steel construction. Easy to work. Simply insert
into unit, give quarter turn—disposal operates again.
One use will save many times cost. Used extensively
by plumbers, apt. house owners, bldg. supts. Get
this bargain today. Sold on money-back \$2.95
guarantee. Postpaid.....

Send check, money order. Specify brand of disposal.
\$1. dep. COD's, DEALERS—AGENTS write for prices.
Foreman Metal Products 11770-A Gateway Blvd.
Los Angeles 64, Calif.

NEW WOOD FASTENERS

hardened
steel



For hard
and soft woods.

Don't Split Wood — Use "CHEVRONS"

Draws wood together eliminating doweling, mor-
tising. Hammer in—"Presto"—a firm joint. No
distortion. 3/4" depth, for thickness wood up
to 1 1/2". At your dealer or send only
\$1.00 NOW for GIANT box, post-
paid. Money back if not delighted.

E. B. PACKARD CO., Inc.
Dept. PS-11
139 CEDAR ST.,
NEW YORK 6, N. Y.



Make Money
SELLING
Eshelman
Kulti-Mowers
and DOING
GARDEN
WORK

FOR BETTER LAWNS AND GARDENS

also POWER MOWERS
and RIDING TRACTORS
Women can operate it

also Power Reverse
Free Catalog. Write
ESHelman CO.
Dept. 219, 119 Light St.
Balto. 2, Md.

Low As \$95 Plus Tools

1 1/2 H.P.

RAKES
PLOWS
CULTIVATES
HARROWS
HAULS
SPRAYS
SAWS
DOZER
MOWS
CUTS
ROLLS
SNOW PLOW

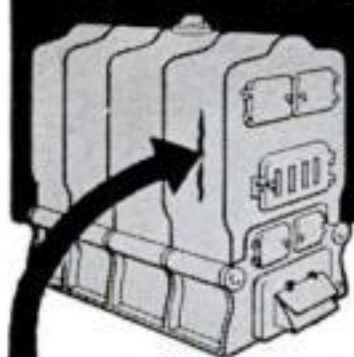
HOW TO BUILD 78 RADIOS!

The giant book, *Radio For The Millions*
tells you how to build 78 radios and phono-
graphs! Imagine! 192 pages, 648 pictures
on building an 8-tube FM set, a 2-way radio sta-
tion, bicycle radio, floor lamp set, vest pocket
portable, midget AC-DC set, superhet, high-fidelity
amplifier, all-wave receiver, home recorder, etc.
Plus full details on "trouble-shooting" and hand-
some cabinet suggestions! So order now—send no
money! When book arrives, pay postman only
\$1.49 plus postal charges for handsome cloth bound
regular edition. If after 7 days' free trial you aren't
delighted, return it for full refund. Order today
while copies are still available; write:

POPULAR SCIENCE, Dept. 1151, 353 4th Ave., N. Y. 10, N. Y.

STOP FURNACE LEAKS

**Save
Fuel Costs**



Seal up every heat-wasting crack, opened seam and other leak in your furnace, boiler, tank, radiators and piping tight—as professional repair men do—with Smooth-On No. 1 Iron Cement. Do it yourself—now—and cut this winter's fuel bills. You apply Smooth-On like putty, it hardens like metal, and stays tight, because it expands slightly as it sets. Buy Smooth-On No. 1 in 1 3/4-oz., 7-oz., 1-lb., or larger sizes at your hardware store. If they haven't it, write us.

FREE Repair Handbook

40 pages of ingenious, tested, short-cut repairs. Simple directions. 170 illustrations. Write today for YOUR free copy of the Smooth-On Handbook.

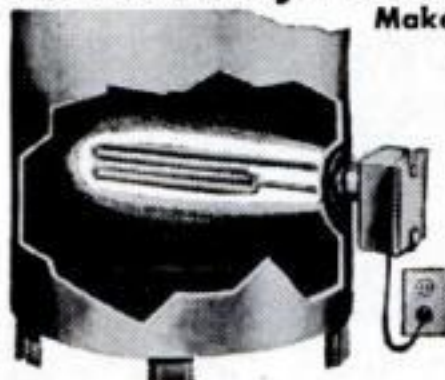
SMOOTH-ON MFG. CO., DEPT. 58L
570 Communipaw Ave., Jersey City 4, N. J.

Do it with
SMOOTH-ON
THE IRON REPAIR CEMENT OF MANY USES



How to Always Have HOT WATER

Make Your Own Automatic Electric Water Heater **\$19.95**
now for only



ONE YEAR GUARANTEE

U. L. Approved Heater

Between 120 to 180 degrees. Replaces coal, oil, gas in home, store, summer cottage, green house, farm, barn, stock tank, poultry scalding, factory. Uses only 1/3 to 1/2 c electricity per gallon hot water. Why burn expensive main furnace unit for hot water? Send check or M.O. NOW! save postage charges. ORDER NOW . . . TODAY. Money back in 10 days if not delighted.

COLLOID EQUIPMENT CO., INC. Dept. PS11, 50 Church Street, New York 7, N. Y.

Install in 5 min. No disturbing or draining of tank or pipes

Why suffer without hot water? Enjoy lots of it to wash, bathe, shave. Heater keeps water HOT in your present tank. Turns ON when needed—shuts OFF when water is heated. No flue, dirt, fire!

Ideal for 30-gal. tanks. Heater screws into any size boiler tap as shown. Plugs into outlet . . . 1320 w. 110 v. AC. (also 2000 w. 220 v. model for BX cable \$19.95)

. . . works automatically thereafter. Temperature adjustable between 120 to 180 degrees. Replaces coal, oil, gas in home, store, summer cottage, green house, farm, barn, stock tank, poultry scalding, factory. Uses only 1/3 to 1/2 c electricity per gallon hot water. Why burn expensive main furnace unit for hot water? Send check or M.O. NOW! save postage charges. ORDER NOW . . . TODAY. Money back in 10 days if not delighted.

*Make lasting
Metal
Repairs*

WITH →

FREE: "Soldering Simplified." 16 page Illustrated booklet. Get your copy now.

Kester Solder Company
4254 Wrightwood Ave.
Chicago 39, Illinois



*Your Car Deserves
the Winter Safety
of BOWES
Radiator Chemicals*

★ Use BOWES Radiator and Cooling System Chemicals if you want "smoother motoring" during the coming frigid winter months. You'll get much higher motor efficiency . . . and save on anti-freeze if your radiator and cooling system are properly prepared for winter driving thru the use of these BOWES Radiator Chemicals.



BOWES KLEN-ZUR

Amazingly efficient, acid-free cleaner . . . breaks up rust, scale and lime formations. Flushing then cleans out these dangerous heat retainers and prevents overheating which wastes anti-freeze.

BOWES RUST-ROUT

Protects cooling system by preventing accumulation of rust, also lubricates water pump. A "MUST" for all motors without grease fitting on water pump.

BOWES STOP-LEAK

Stops leaks in radiators and cooling systems, and minor cracks in motor blocks. Don't lose your expensive anti-freeze—use Bowes "Stop-Leak" now and be sure.

★ It takes so little time to condition your cooling system for winter driving . . . yet it can be so costly and troublesome to neglect it. Don't delay—prepare NOW for winter with BOWES Cooling System Chemicals!

DRIVE IN
*Where You See
This Emblem*



BOWES "SEAL FAST" CORP., INDIANAPOLIS 7, IND.

NOVEMBER 1951 281

SAVE OVER 50% ON THESE BRAND NEW WAR SURPLUS POWER UNITS



**BE PREPARED
for any emergency!**

LIGHT PLANT BUYERS—

in emergency telephone collect—unit shipped same day!

5 KW Plant, 120 volts,
60 cycle AC. List today
\$1910.00 Used \$675.00
NEW. Your price only

\$895.00

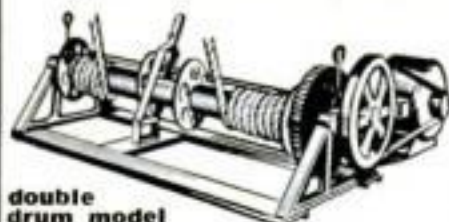
BARGAIN SPECIALS!!

Ball-Bearing Arbor... \$6.95
Alarm Siren or Horn \$15.45
Mercury Heat Control \$5.95
Electric Hot Water Heater,
10 gal. \$24.95
Hot Rod Supercharger \$31.00
NEW 1 1/4 HP Briggs & Strat-
ton. AP Lists at \$103 \$42.50
Gear reducer, 80-1 ratio
List \$45.00. Only \$22.00
Aircraft heater, 50,000
BTUs. Value \$125. Only
\$19.95

Ohm meter, 0-25, leather case, List \$29.50 Only \$7.95
1/2 Ton Shop Wagon, rubber wheels, Value \$69.00 Only \$48.00
Air Compressors, 1/2 to 10 HP, large savings!
Heavy duty 3/4 HP Electric Motor, 110-220 V, AC, mfr'd by
B-line or GE. Lists at \$74.00 Only \$42.00

2500 Watt, AC, 110 volts, 60 cycle,
Slightly used but reconditioned and
fully guaranteed ONLY \$295.00
NEW, same as above \$345.00
Plants built in 1951. \$426.00
3000 Watt, 110-220 volts, with AUTO-
MATIC battery starter, \$465.00
300 Watt, Reg. \$145, Now \$99.00
750-1000 Watt, NEW \$169.00
1000-1200 Watt, NEW \$194.00
1500 Watt AC, New \$275
2000-2500 Watt, NEW \$294.50
3000 Watt DC Contractor's PORTABLE,
Rubber tired wheels, 5 to 7 HP gas en-
gine. Used like new \$220.; New \$279.00
7500 Watt 4 cyl. engine: New \$995.00
10,000 Watt Used \$1195.00; New
\$1495.00
25,000 Watt Used \$1995.00; New
\$2495.00
35,000 Watt Diesel, Rebuilt, \$2995.00
50,000 Watt Diesel, New, \$5900.00

SENSATIONAL WINCH VALUES



double
drum model

For—Contractors, Boats,
Farmers, Trucks, Loggers, etc.
WINCHES, 1,000 lb. capacity,
Hand operated, \$9.95
WINCHES, Hand operated ball
bearing model, 1500 lb. cap.
3-1 ratio, hand brake, two
sneeds, \$39.50
WINCHES, 6,000 lb. double
drum, Hand operated, \$49.50

WINCHES, 1,500 lb. capacity, Electric drive, \$ 89.50
WINCHES, 6,000 lb. capacity, Electric drive, \$188.00
CABLE, 1/4" preformed stainless steel aircraft; 100 ft. or less, 17c
per ft.; over 100 ft., 15c per ft.

SEND TODAY FREE CATALOG Thousands of \$5 saving buys. These
are a few of the many items at sensa-
tionally low prices!

Pumps Drop Cords Fire Pumps Clutches
Grinders Generators Saws Air Tanks

C&H ELECTRIC MACHINE Co. Inc.

438 W. Juneau Ave., Milwaukee 3, Wisconsin

NEW DREMEL Electric

RAZOR BLADE SHARPENER

GUARANTEES

**100 SHAVES
FROM
ONE BLADE**

**... Gives You The
SMOOTHEST SHAVES
YOU EVER HAD!**

(Pat'd)

**Only
\$9.85**

DOUBLE-EDGE BLADES ONLY

Now you can get the finest shaves of your life! For this new Dremel Sharpener assures the sharpest, smoothest cutting blade you ever used... every time. Tests on all type beards prove you can also get 100 and more velvety-smooth shaves from only one blade. Blade savings? Sure! But more important is the downright shaving comfort you have always wanted and can now enjoy.

UNIQUE GIFT FOR ANY SHAVER!

Electrically hollow-hones and strops in 15 to 20 seconds for sharpest edges ever. Users say it makes even new blades shave better. Plastic housing 2 1/2" x 3 1/4" x 3 1/4"; 110-120 V., AC-DC. Details gladly furnished, but why wait? **Order today!** If dealer can't supply, send check or Money-Order for postpaid shipment on 10-DAY TRIAL, MONEY-BACK GUARANTEE.

DREMEL MANUFACTURING CO., Dept. 121-L,
RACINE WISCONSIN

**LUBRIPLATE
KEEPS TOOLS LIKE NEW
PREVENTS RUST
AND LUBRICATES TOO!**



TRY LUBRIPLATE! Not an old-fash-
ioned oil that runs off or gets gummy
LUBRIPLATE is a new, white and clean,
semi-fluid lubricant that stays put.

• In handy 20¢, 35¢ and 95¢ tubes at
Hardware and Sporting Goods Stores.

• Dealers write to LUBRIPLATE DIVISION,
Fiske Bros. Refining Co., Newark 5, N.J.

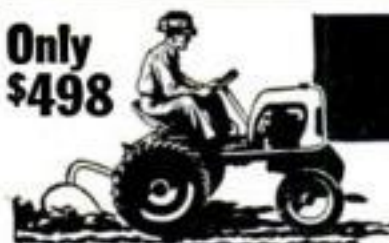
**DO MORE THAN LUBRICATE IT—
"LUBRIPLATE" IT!**



How to Get Better Paint Jobs!

Send for free illustrated 24-page booklet—
tells how to buy and apply right aluminum
paint for all jobs around the house. We don't
make paint, but prepared this booklet to help
you get better results with aluminum paint.
Write for free book "Paint it Bright".
ALUMINUM COMPANY OF AMERICA,
1717 L Gulf Building, Pittsburgh 19, Pa.

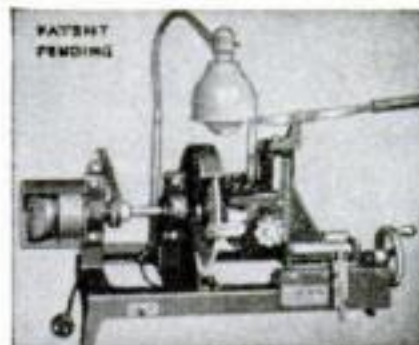
**Only
\$498**



OTTAWA Mule Team Tractor

Finest low-cost tractor. Costs too
little to do without. Engines burn
gasoline. Seven models. Starter and
lights available. Other larger Models
to choose from. Over 4,000 in world-wide use. Time-proved and tested.
At low cost they easily mow, plow, disc, harrow, plant, cultivate, etc.
Sold only direct to user. Write for FREE details.

OTTAWA MFG. CO., 2-101 Garden St., Ottawa, Kansas



Start a NEW BUSINESS!

or Add to your present
Repair Business

SHARPEN DULL PIPE WRENCHES

PIPE TAPS & DIES
"GUM" CIRCULAR SAWS

Write for Information

J. C. MOORE INDUSTRIES
BOX 5 276, Fredonia, Pa.

CUT MOULDING! DO SANDING!

ON YOUR TABLE SAW

WITH THESE FULLY GUARANTEED
INDUSTRIAL QUALITY ACCESSORIES



CUTTER HEAD
1/2, 3/4 or 1" ARBOR
Only **\$4.50**

8" SANDING DISC
1/2, 3/4 or 1" ARBOR
Only **\$4.95**



Moulding Cutters per set \$3.85
38 DIFFERENT PATTERNS

Extra Sand Paper Pkg. 80c
INCLUDES ASSORTMENT OF 5 GRITS

SEND CHECK OR MONEY ORDER • WRITE FOR FREE CATALOG No. 5-11

JAXON COMPANY • 369 ELLICOTT ST. • BUFFALO 3, N. Y.



THIS YEAR MAKE IT A

Dremel Christmas



DREMEL QUALITY TOOLS ARE IDEAL GIFTS TO GIVE OR GET!

Lucky the man, woman, or child who receives Dremel quality gifts for Christmas! For these are America's finest power-in-hand tools. We invite you to compare them with any similar products made—point by point, feature for feature. Then you'll know why

Dremel guarantees finer performance, longer life, than anything your money can buy. For shop projects, home maintenance, or favorite hobby—it pays to insist on DREMEL and accept no substitute. Order yours today—in time for Christmas!

1 MOTO-TOOL KIT No. 2—Dremel's Model 2 Moto-Tool is the fastest, most powerful tool in its class—delivers approximately 27,000 R.P.M. It grinds, carves, routs, drills, engraves, sharpens, etc.—works well in wood, plastics, metal. Saves plenty on home maintenance jobs. Performs hundreds of shop operations, and for hobbies it's a must. Precision made, shockproof, 110-120 V. A.C.-D.C. Motor, Moto-Tool No. 2 only, \$16.50. Complete Kit with 23 high quality, shop-tested accessories (High-Speed Steel Cutters, Grinding Wheels, Polishers, etc.), Only..... **\$23.50**

2 MOTO-TOOL KIT No. 1—Contains lighter capacity No. 1 Moto-Tool with 34 accessories (steel cutters, grinding wheels, etc.) in attractive, lacquer-finish wood case. *Biggest bargain in the field!* Tool alone with 1 emery wheel point is only **\$9.85**. Complete kit, Only..... **\$17.50**

3 PORTABLE DRILL PRESS—(Uses No. 2 Moto-Tool) Adds versatility to Moto-Tool operations. Ideal for model-making, wood carving, routing, etc. Precision built, 12" high. Price (less Moto-Tool) Only..... **\$9.95**

4 MODEL 2000, SANDER-POLISHER—Fastest seller in the field. *Straight-line reciprocating action guarantees scratch-free finishes.* A fast-cutting production sander (14,400 sanding strokes per min.) for heavy-duty craft and wood-working projects, refinishing and redecorating. Gives you necessary power—easy one-

hand operation—and 21 sq. in. of sanding surface for furniture making, boat building or refinishing, resurfacing large areas, building operations such as dry-wall joints, woodwork, siding and exteriors. Does a superb polishing job! Weighs 5 lbs.; needs no oiling; permits 10-second paper change; dustproof. Over-all size 3½" x 4½" x 7"; 110-120 V., 60 cycle A.C. With steel carrying case, 25 asst'd. abrasive sheets, sheepskin pad, Only..... **\$24.50**

5 MODEL "A" SANDER-POLISHER-MASSAGER—A lighter-capacity machine with same construction features as larger model—including *straight-line action for scratch-free finishes* and 14,400 strokes per min. By far, the most popular sander ever offered home owners, house-wives, hobbyists for all their sanding, polishing, refinishing tasks. Also a soothing massager! Wt. 2½ lbs.; sanding pad 2¼" x 5½". Complete with asst'd. sandpapers, a felt and sheepskin polishing pad, Only.... **\$14.85**

6 ELECTRIC COPING SAW—Safe as a handsaw—cuts scrolls like magic—sands as it saws! For home, hobby, repair work—no other tool pleases so much for so little cost. Works in any direction—smoothly delivers 7200 strokes per min. Saws through ¾" medium-hard wood at foot-a-minute speed. Trigger-touch foolproof action. Only 2 moving parts, never needs oiling, 110-120 V., A.C. *Free plans* packed with each saw for 6 useful wood projects, and for making your own table-type jig saw! With 3 saw blades, Only..... **\$5.85**

DREMEL Electric TOOLS

for SHOP and HOME



SOLD BY BETTER DEALERS EVERYWHERE—

If yours doesn't carry, remit in full for postpaid shipment. Or send only \$2 now, pay postman balance plus postage and COD fee. *Five-day trial, money-back guarantee!*

DREMEL MFG. CO. Dept. 121-L Racine, Wis.

SAVE THREE WAYS WITH A NEW Cushman

WRITE
FOR FOLDER
AND PRICES

DEPT. 21-S



Get the big three Cushman economies—low purchase price, low operating cost, low maintenance. Ride the Cushman scooter to work, school or shop. Less than a penny per mile to operate. Dealer inquiries invited.

CUSHMAN MOTOR WORKS Lincoln, Nebr.

KEEP WORKSHOP TOOLS LIKE NEW!

Krylon Acrylic coating protects, preserves, waterproofs, rustproofs, beautifies. Use it on almost any metal, paper, leather or wood surface. Just spray it on!



If you prize it—**KRYLON-ize** it!

Krylon is a miracle of modern chemistry—a crystal-clear ACRYLIC coating that seals out water, air, moisture, dirt. Just press the button on the aerosol can and spray Krylon on. That's all there is to it! Krylon won't change color, crack or dry out. Waterproof, non-inflammable. There's absolutely nothing like Krylon. It's America's Acrylic spray. "Krylon-ize" home and garden tools, kitchen cabinets, leather bags and luggage, valuable papers, nailheads and screwheads, photographs, washable walls, etc., etc. Scores of uses in every home! Big 12 oz. aerosol spray can at hardware and paint counters everywhere.

KRYLON is also available in ALUMINUM and BRIGHT WHITE

All the qualities of clear Krylon, plus brilliant color. Krylon colors cover more surface, last longer, clean easier, are easier to apply than paint or enamel. Big 12 oz. aerosol spray cans.

KRYLON, INC.
2601 N. Broad St.
Philadelphia 32, Pa.

Say "KRYLON" at Your
Hardware Counter

A PUSHOVER

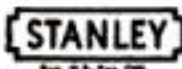
for
driving-drawing
screws

It turns while you push—the "Yankee" No. 130A Spiral Ratchet Screw Driver speeds screws on their way—with ease. Quick-return spring holds blade in slot and returns handle after each stroke. See this and other handy "Yankee" tools on display at your dealer's. Write for "Yankee" Tool Book. North Bros. Mfg. Co., 5111 West Lehigh Ave., Philadelphia 33, Pa.



"YANKEE"
No. 130A
Spiral
Ratchet
Screw Driver

"YANKEE TOOLS
NOW PART OF



THE TOOL BOX
OF THE WORLD

NORTH BROS. MFG. CO., Philadelphia 33, Pa.

IT STAYS FIXED



WITH SPEED NUTS®

SPEED NUTS—the fasteners that won't vibrate loose—now available in handy kit. Ten popular sizes with matching screws. Replace threaded nuts and lock washers in repairing all types of metal, wood, plastic products. Over 100 parts for only \$1. Send cash, money order, check—no stamps—no C. O. D.



TINNERMAN PRODUCTS, INC.
Dept. 13-A, Box 6688, Cleveland 1, Ohio

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide \$1.75, 1 1/2 in. \$2.25. Jointing cutters, B 1 in. \$1.75, 1 1/2 in. \$2.25. E 1 in. for drop-leaf tables, \$1.75. E 1 1/2 in. Makes 3/4 in. cove & Quarter, \$2.25. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM
Rt. 2-P. Clearwater, Fla.

NO PARTS TO FLY OFF!!

TUNE IN THE AUTO-LITE SHOW

"Suspense!"

MONDAY NIGHTS-CBS • TUESDAY NIGHTS-CBS-TV

AMAZING NEW WOOD-TURNING TOOLS

OUTLASTS STEEL 50 TO 1!

These remarkable tools tipped with TUNGSTEN CARBIDE will astound you with their performance. They work FREE HAND equally well in wood, plastic or soft metals—and at the same time hold their razor-like edge almost indefinitely. Tests show that they will turn wood or plastic for days and days CONTINUOUSLY without showing any signs of dulling. They are the finest tools available at any price. Beautifully finished 5" blade—flush ground, polished tip—finest brass tube ferrule—9" hardwood handle—over all length 14"—25 tools to choose from: round and square nose from 1/8" to 1 1/2"; cut off; 1 1/2"x30° skew, spear, r. & l. skew, turning and parting. Amazingly Low Prices! Write at once for free literature.

JOHNS MFG. CO., DUNELLEN 9, N. J.

Only \$4.98 SPATZ NEW FIREARM! LOW COST RIFLE FOR TARGET AND GAME

16 mg. powder charge drives
18 caliber pellets at high velocity.
Powerful - Accurate
Easy to handle!
heavy construction
shaped ash
stock



new
development
low cost shooting!

Free instructions: "Expert Rifle Shooting", "Setting up Indoor Target Ranges". Ammunition at your dealers 300 for \$1. Limited quantity of Spatz rifles. Complete with 50 pellets. To be sold direct. Adults only—State age. Send \$4.98 to LUNDE ARMS CORP., Box M, San Gabriel, Calif.

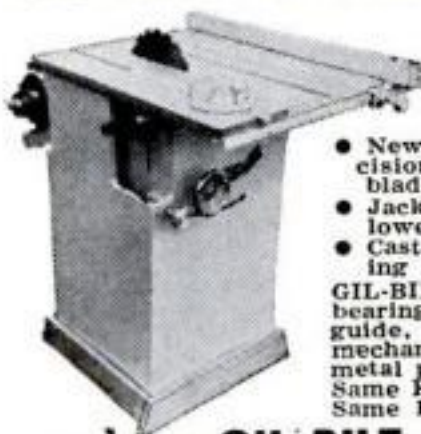
BUILD YOUR OWN POWER TOOLS—TILT/ARBOR SAW

Exclusive GIL-BILT Build-It-Yourself Features

- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum, and steel construction
- Capacity and performance of commercial saws selling for \$60 and up

BANDSAW
BELT SANDER
SAVE \$50.
OR MORE

GIL-BILT 10-INCH TILTING ARBOR SAW



- 27x28 in. table, 13½ in. capacity in front of blade
- 10 in. blade cuts 3¼ in. deep, tilts full 45 degrees
- Floor model 34" high, table always stays level

- New Departure ball bearing arbor, ¾" precision shaft turned down for 5/8" bore blades, alum. housing, shipped ready to run
- Jackscrew and 4½ in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

GIL-BILT Metal Parts Kit includes Plans, ball bearing arbor, miter gauge and bar, rip fence guide, dado insert, lock knobs, jack screw mechanism and handwheel, and all other metal parts (less blade).....\$20.95
Same Kit with 10" Combination Blade\$24.90
Same Kit with 8" Combination Blade\$23.90

GIL-BILT 12-INCH BAND SAW



- Cuts to center of 24 inch circle
- Handles stock up to 6 inch thick
- 18x18 inch table tilts 45 degrees
- Lower wheel and drive pulley runs on sealed New Departure Ball Bearings; Upper wheel runs on two 5/8" bore Oilite Bronze bearings

- Upper wheel tension and tilt mechanism of cast aluminum, completely assembled
- Upper and lower blade guides. Each has ball thrust bearing, self-lub bronze jaws
- Rigid cast aluminum wheels fully machined ready-to-install. Heavy rubber tires
- Uses standard 78 inch blades up to ¾ in. wide
- Fully enclosed mechanism for utmost safety

GIL-BILT Metal Parts Kit includes Plans, rubber tires, aluminum wheels, ¼ in. blade, ball bearing spindle, tilt mechanism, blade guides, table tilt segments, and all other metal parts.....\$20.95

Return Kits in 10 days for refund if not satisfied.

(Prices include postage within 600 miles. Over 600 add 5%)

Also available—Plans and Parts Kit for Belt Sander and 8" Tilt/Table Saw. Order Plans at \$1.00 each—Send postpaid anywhere in the world or write for FREE descriptive catalog.

GILLIOM POWER TOOLS P. O. Box 1-VL, Lambert Field St. Louis 21, Missouri

Make Your Own POWER LAWN MOWER

with this DRIVE CUTTER ASSEMBLY

Constructed for those who desire to build their own mower or to replace your old cutter assembly. Complete with 18" blade and double ball bearing drive, only.....

\$12.95



Add 50c to cover handling & shipping. No COD's

ATLAS EQUIPMENT CO., Dept. PS-11
229 SW BLVD. KANSAS CITY, MO.

HOBBYISTS! SHOPMEN! Special ONLY \$54.50

PALMGREN "HOBB-E" Rotary, Index, Milling Table

Ideal for Model Parts or Shop Work

Mill-Grind-Drill-Index-Rout curved or straight-Rabbet and Mortise on drill press or lathe. 8" Table, 4" Cross Feed, 360° Rotation, Accurately Graduated. Bolts to table. Order NOW! SAVE \$100. Only \$54.50. Less Rotary Feed \$43.75. Write for "HOBB-E" Tool Circular.

CHICAGO TOOL AND ENGINEERING CO.
8396 South Chicago Ave. Chicago 17, Ill.



DRILL PRESS OWNERS!

HERE'S 1 TOOL WITH 5 DISTINCT USES



THE BARRON MULTI-PURPOSE ROTARY WOOD PLANER

PLANES & SURFACES • PANELS & BEADS
ROUTS & GROOVES • RABBETS • TENONS

\$7.50 COMPLETE

Finest precision performance—certainty of skilled workmanship—time-saving, money saving short cuts—yours with world famous Barron Drill Press Tools. Fifteen important operations—all available on any standard drill press—with Barron Accessories. Equip your shop with these versatile exclusively designed tools—and save up to \$500. 200,000 Barron owners have bought on our liberal 10 day full money back guarantee. Order, or write for catalog.

BARRON TOOL CO. INC.

366 Architects Bldg., Detroit 1, Mich.

FREE
Workshop
Guide &
Catalog

Big, Money-Saving Offer Repeated by Popular Demand

MEYERCORD'S AMAZING, LIFELIKE PLASTIC VENEER

it's easy to DECORATE

- furniture
- cabinets
- lamp bases
- book ends
- walls, doors
- table tops
- re-finish old pieces

Re-creations of rare wood grains and fine marble

SAVE NOW! SEND FOR INTRODUCTORY PACKAGE!

Now—Meyercord, originators of Plastic Veneer, again offers you re-creations of rare wood grains and fine marbles at a big saving! Used on furniture and TV cabinets for years, yet easy to apply at home—on wood, metal, glass or composition. Praised by thousands

of home craftsmen for amazingly beautiful results! Plastic Veneer can be used on any flat or simple curved surface—can be top-coated, rubbed or waxed. Start your first project today! Order a supply now!

INTRODUCTORY OFFER!

3 sheets of plastic veneer

1 can of cement

1 squeegee

ALL FOR ONE PRICE

\$5.00
POST PAID

CHECK COUPON—MAIL TODAY!

THE MEYERCORD CO., Dept. 69-11 5323 W. Lake St., Chicago 44, Ill.

Please send me your \$5.00 introductory offer of 3 sheets of Meyercord Plastic Veneer, squeegee, cement and complete instructions. Patterns are checked below.

Enclosed find ☐ check ☐ M.O. for \$5.00. Additional sheets of wood grains, pearl or gingham @ \$1.50 ea.; marbles @ \$1.75 ea. Every sheet contains approx. 6 sq. ft.

- | | |
|--|---|
| <input type="checkbox"/> Prima Vera | <input type="checkbox"/> Carpathian Burl |
| <input type="checkbox"/> Aspen Crotch | <input type="checkbox"/> French Rosewood |
| <input type="checkbox"/> Straw Carpathian | <input type="checkbox"/> Butt Walnut |
| <input type="checkbox"/> Satinwood | <input type="checkbox"/> Walnut Stump |
| <input type="checkbox"/> Straw Zebrawood | <input type="checkbox"/> Italian Walnut |
| <input type="checkbox"/> Lined Oak Tan | <input type="checkbox"/> Rhododendron Burl |
| <input type="checkbox"/> Straw Stump | <input type="checkbox"/> Macassar Ebony |
| <input type="checkbox"/> Blond Harewood | <input type="checkbox"/> Guineawood |
| <input type="checkbox"/> Bleached Mahogany | <input type="checkbox"/> Fiddleback Walnut |
| <input type="checkbox"/> Bleached Fiddleback | <input type="checkbox"/> Walnut Angle Grain (45°) |
| <input type="checkbox"/> Gray Harewood | <input type="checkbox"/> Mottled Pearl—Gray |
| <input type="checkbox"/> Prima Vera Gray | <input type="checkbox"/> Mottled Pearl—Maroon |
| <input type="checkbox"/> Lined Oak Gray | <input type="checkbox"/> Mottled Pearl—Blue |
| <input type="checkbox"/> Striped Mahogany | <input type="checkbox"/> Red-White Gingham |
| <input type="checkbox"/> Fiddleback Mahogany | <input type="checkbox"/> Blue-White Gingham |
| <input type="checkbox"/> Mahogany Crotch | <input type="checkbox"/> Black and Gold Marble |
| <input type="checkbox"/> Mahogany Stump | <input type="checkbox"/> Breche Rose Marble |
| <input type="checkbox"/> Walnut Crotch | <input type="checkbox"/> Jaune Benou Marble |
| <input type="checkbox"/> French Walnut | <input type="checkbox"/> Mexican Onyx |
| <input type="checkbox"/> Quartered Walnut | <input type="checkbox"/> Rose de Brignole Marble |
| <input type="checkbox"/> Ribbon Walnut | <input type="checkbox"/> Skyros Marble |
| <input type="checkbox"/> Striped Walnut | <input type="checkbox"/> Verdi Antique Marble |

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

(Offer good in continental U.S.A. only)

Make Your Drill a Power Saw with

FEDCO
MADE IN U.S.A.
Saw-Rite

You will never use a handsaw again!

Fits Any 1/4" Drill
Model 605

only **\$10⁹⁵**

Complete with Combination 4-inch Blade and Bevel-Tilt Rippage. Fully Adjustable.

Most popular tool of its kind... zips through wood, plastics, wallboard, etc.

The Unique BEVEL-TILT-DEPTH-RIPPAGE allows depth of cut from 1/8" to 1 1/4". Bevel cuts any angle from 0 to 45 degrees with no screws to move. Rippage adjustable for accurate width molding, etc.

EASY ONE-HAND OPERATION

Tens of thousands of FEDCO "Saw-Rites" are now in use all over the country. Careful design, rugged precision manufacture, and a better blade make the "Saw-Rite" the best in the field. Quick-acting, worm-drive, patented clamp gets it on and off your drill in seconds. Combination blade is chrome nickel alloy steel, precision ground, correctly heat treated, balanced and fitted. Grooves, dados, cross-cuts, rips, hour after hour without sharpening. Cuts plywood, shelving, wallboard, 2 x 4's to 2 x 10's, in two cuts, one from each side. Special sighting guide notch enables you to accurately follow line in both straight and bevel cuts. Extra wide base plate for better balance. One or two-hand operation with hand knob. Lifetime Oilite bearings, finest quality hardened shafts, and coppo-steel gears. One-piece aluminum housing.

90-Day Factory Guarantee

FEDCO Replacement Blades:

#504C 4" Combination\$2.00
#504R 4" Rip.....\$2.00
#504M 4" for Soft Metals....\$3.00

Try FEDCO "Saw-Rite" for 15 Days... Money Fully Refunded if Not Satisfied. Order from your Dealer, or send us your Check or Money-Order. All prices post-paid, except C.O.D.'s.

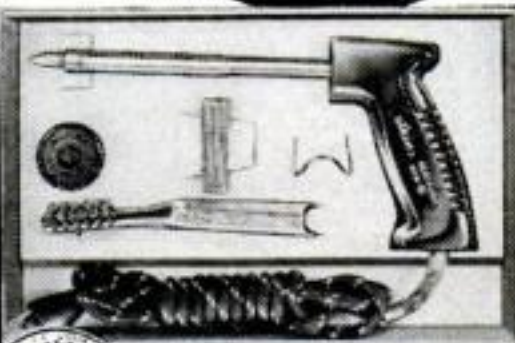
DEALERS... Write for Nearest Jobber, Dept. S.2,

FEDERAL ENGINEERING CO., S. 2, 37 Murray St., New York 7, N. Y.

A necessity for EVERY home owner, hobbyist, mechanic & repairman. Ideal for general soldering, electrical, radio, TV, home & hobby

atkins
5 PC. ELECTRIC
PISTOL GRIP
SOLDERING
IRON KIT

all for only
\$3⁹⁵
Post Paid!



80 watt, ac-dc
110-120 volt
UNCONDITION-
ALLY GUARAN-
TEED



USE HANDY
ORDER COUPON

Look what you get:
ELECTRIC SOLDERING
IRON with heatproof pistol-
grip that fits hand.
SOLDERING IRON STAND
WIRE CLEANING BRUSH
WIRE SOLDER & FLUX

atkins INDUSTRIES, INC.

Dep't. P.S. 11
1435 Hubbard St.
Chicago 22, Ill.

☐ Enclosed \$3.95
(check, money or-
der). Send Kit
POSTPAID.

☐ Enclosed \$1.00
part payment, will
pay bal. on C.O.D.
delivery.

Name _____

Address _____ Zone _____

City _____ State _____



FIX MESSY TUB CRACKS

Fill those cracks around your bathtub, sink and shower with Miracle Tub-Caulk. It's easy with this new product that is applied just like toothpaste! Dries in one hour leaving a tough, waterproof and greaseproof bond that will not shrink or crumble. Giant 4 ounce tube.

Satisfaction Guaranteed

or Money Refunded

ORDER FROM DEPT. T-6

\$1 post
paid

sunset house

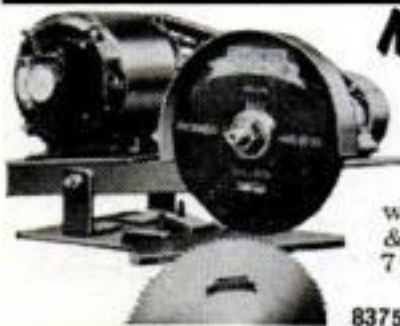
8818 Sunset Boulevard, Hollywood 46, California



Print Your Own

Cards, Stationery, Advertising, labels, circulars, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too. **Print for Others, Good Profit.** Have a home print shop. Easy rules supplied. Pays for itself in a short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, N-33, Meriden, Conn.



NEW Saw Sharpener

Improved #64 Hand Gummer sharpens all types circular saws 4" to 20" diam. Ideal for saw shops. Self-Centering adjustment for quick, easy set-ups. Complete with 1/4 HP motor, 1 grinding wheel & cord. **\$79.50** FOB Portland, Wt. 70#. SEND FOR FREE LITERATURE.

P. T. HOBBS MACHINERY

8375 N. Interstate Ave., PS-111, Portland 17, Oregon

VARIABLE SPEED

HYDRAULIC POWER
TRANSMISSION



It has Infinite Speeds 0 to 550 Reverse Automatic Overload Protection; Adjustable Torque up to 180 inch pounds. 5/8" Input and Output Shafts. It will handle 1/4 to 1 1/2 H.P. Motor. Case measures 7 1/2" long 7" high 6 1/2" wide. VALUE OVER \$300. Shipping Wt. 25#. On C.O.D. Orders we require a 10% Deposit.

only **\$54.50**

Feb. Chicago

DIRZIUS MACHINE SHOP "T" 1423-25 So. 52nd Ave., Cicero 50, Ill.

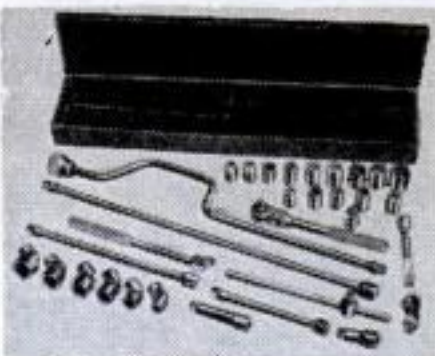
TOOLS AT WHOLESALE

DIRECT FROM FACTORY

Full line of top quality, fully guaranteed, chrome, factory-new mechanics hand tools. You save

HALF REGULAR PRICE

for tools of this quality. Our Permanent Price Protection Plan guarantees you wholesale prices.



WRITE TODAY FOR FREE CATALOG

MECHANICS CO-OP

Dept. B

OAKLAND 8, CALIFORNIA



WELLWORTH AIR COMPRESSOR

For Farm and Home Workshop
Compressor has 2" bore, 1 3/4" stroke, 2.8 cfm up to 150 lb. pressure. Motor required: 1/4 h.p. at 100 lbs.; 1/3 h.p. at 125 lbs.; 1/2 h.p. at 150 lbs. or equivalent gas engine. V-belt drive, intake muffler and cleaner, bronze bearings, splash lubrication. Wt. 16 lbs. Replacement parts always available. **\$20.50**

COMPLETE OUTFIT. Compressor, pressure tank, air gauge, air chuck, 20 ft. hose, pop valve, copper tubing with 4 brass flared fittings for connecting compressor to tank, 4-way cross and 3 nipples. **COMPLETE OUTFIT, wt. 30 lbs. \$32.45**

Equipment less compressor **\$12.45**
Tank only, **\$6.25**



**All Brand
New Equipment**

BARGAIN LIGHT PLANT

1952 Model, 5000 watts, 110/220 volts, 60 cy. AC, one phase, 50 amps. Takes starting overload up to 87 amps. Integrally mounted separate exciter giving exceptional overload and surge capacity for starting motors. Drip-proof constr. Ball bearing, lifetime lubrication. Voltmeter, 2 plug-in receptacles. Wisc. air cooled, 2 cyl. 4 cy. 10 1/2 HP engine. Special Price **\$525**
Generator only **\$325**
Wt. 575 lbs.
Wt. 225 lbs.

**BRAND
NEW**

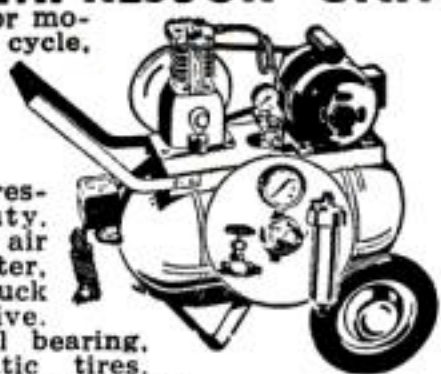
GENERATORS

Big Values
500 to 750 watt, A.C., 110-120 volt, 60 cycle, 1 phase output. Also 100 watt D.C. battery charging output. May be used at the same time. Voltmeter, 2 outlet boxes. Wt. **\$99.50**
55 lbs. Price.....
Furnished with 1 1/2 HP Engine with drive **\$142.50**



AUTOMATIC COMPRESSOR UNIT

1/3 H.P. heavy duty capacitor motor. AC 110/220 volt, 60 cycle, 2x1 3/4 inch piston type compressor, splash feed lubrication, 12x24 inch tank, automatic pressure switch, CFM 2.8 at 100 lb. pressure, or 150 lbs. pressure for intermittent duty. Check valve, safety valve, air regulator with gauge and filter, 20 ft. air hose with air chuck for inflating tires. V. belt drive. Mounted on 2 wheels, ball bearing, with 2"x10" semi-pneumatic tires. Portable with handle. Shipping wt. 90 lbs.
With 1/3 h.p. mo. **\$98.50**
tor **\$160 Value.**
With 1/2 h.p. **\$109.50**
motor.....
Compressor **\$20.50**
only.....



Less Motor..... **\$79.50**
With 1 1/2 h.p. **\$124.50**
gas engine.....
Regulating gauge **\$8.95**
and filter.....

1 1/2 H.P. MOTOR



Delco 110-V, 60 cy. A.C., 1 phase 1750 r.p.m., 2 amps., will take 50% overload. Shaft 1 3/8 x 1 1/4. Heavy duty, bronze sleeve bearing. Size 6" long, 5" high, net wt. 12 lbs. List **\$21.00.**
Special **\$13.50**
Lots of 3, **\$12.50** ea.

WELLWORTH V-BELT CLUTCH



BRAND NEW Takes starting load off engines or motors. When speed is reached, a flip of handle shifts clutch from idling to driving position. Handles "A" belts, 2.35" pitch diameter, 3/8" bore. Ideal for use with lawn mowers, garden tractors, home workshop motors, etc. 3 1/4" long. Safe, easy to mount, sealed bronze bearings, positive action. Shpg. wt. 3 lbs. **\$7.50**
BUSHING FOR 1/2" SHAFT 15c

"WELLWORTH" BLOWER BARGAIN



Special price to dealers in lots of 5 or more. Write us. **BRAND NEW.** Quiet operating. Double wheel inlet, double width blower. For heating, ventilating, cooling, air washing, exhausting and forced draft. DIMENSIONS: 10" wheel; outlet 13 1/8" x 11 1/8"; inlet 8 3/4". Height 19". Width 18". Depth 16 1/2". C.F.M. 1/4" S.P. 1600; outlet vel. 1575. Wt. 45 lbs.
BLOWER LESS MOTOR AND DRIVE..... \$27.50
With belt and variable speed pulleys, **\$2.50**

140 CFM "WELLWORTH" BLOWER

5 1/8"x4" mounting flange with 2 1/2" square discharge, 3 1/2" dia. blower wheel powered by direct-connected 1/15 H.P., 110 V. 60C., A.C. motor with conduit box and 20" leads. 7 1/2" wide less flange by 7 1/4" H. **\$16.20**
x 6 3/4" D. Shpg. wt. 6 lbs.....
50 CFM Blower, 2 1/2" discharge..... **\$10.95**

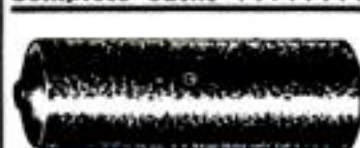


Save \$10.00 On A DRILL-O-MATIC Electric Polisher and 1/4" Drill

Polishes floors, furniture, automobiles; does sanding, drilling, and buffing jobs. Handy family Work-Aid. Limited number available. Act fast. Drill and Polisher combination, 110 Volt AC-DC. Disc Polishing Bonnet; 1/4" Jacobs chuck; horizontal bench stand; 42" polishing handle; wire wheel brush, 2-mounted wheels; 2-drill bits; spindle adaptor, buffing wheel, 6-abrasive discs; 1-grinding wheel; paint mixer; 12 ft. cord & plug; drill handle; steel hinged carrying case with handle and lock clamp. Wt. 9 lbs. 24 pieces. Ideal gift. 50,000 were sold at **\$28.95.** **\$14.95**
Our special price, only.....

AIR TANK AND ACCESSORIES

Brand New steel 6"x24", 400 lb. test. Ideal wherever compressed air is needed. Equipped with 500 lb. combination air gauge and inflation valve with core for retaining pressure in tank; tire chuck, 3 ft. high test air hose. Ship. Wt. 12 lbs.
Complete outfit..... \$7.95

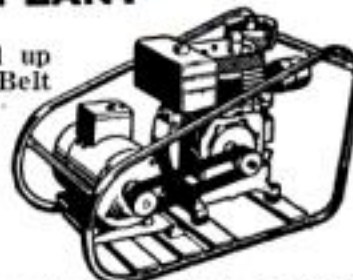


"Wellworth" Pressure Tank

7" x 25" Welded Steel, 3/4" opening on each end, 1/4" and 3/8" opening at centers. Convex Head and Bottom. 100 lbs. working pressure. Shipping Wt. 17 lbs..... **\$9.75**
Same Tank, 9"x27", wt. 28 lbs. **\$14.50**

2000-2500 WATT LIGHT PLANT Heavy Duty Windings

110 v., 60 cy., A.C., takes starting overload up to 5000 watts. Floating Base for Automatic Belt Adjusting, 2-Groove Engine Pulleys, V-Belts, Bolts, etc. 5 H.P. Wisconsin or Briggs & Stratton Model 14 Engine. Voltmeter, 2 plug-in receptacles, Portable Tubular Steel Skid Type Carrier. Dim. L 34 1/2" x W 17" x H 20". **\$299.50**
Wt. 180 lbs.
Same unit less mounting base..... **\$275.00**
Generator only with voltmeter, 2 plug-in receptacles, Shpg. Wt. 75 lbs. **\$169.50**

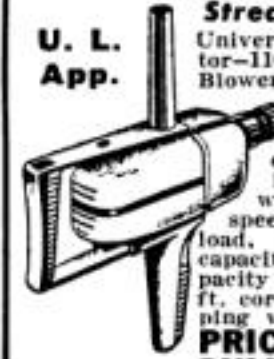


LELAND GENERATORS

2500 watts, 110 v. 60 cy. single phase 1800 r.p.m., self excited, fungus treated for long life. 1951 model. Brand new, in original factory crate. Shpg. wt. 135 lbs. List **\$375.** Special price.. **\$237.50**
Furnished with 6 1/2 H.P. Briggs & Stratton gas engine (or equal) with drive. Wt. 251 lbs. **\$395.50**
List **\$750.** Special price.....

1/2" ELECTRIC DRILL

Streamline Design
Universal air-cooled motor-110/115 V. AC-DC Blower type fan for air cooling. Removable side handle for close quarter drilling. Jacob's Chuck with key. No load speed 450 RPM; full load, 290 RPM. 1/2" capacity in steel; 1" capacity in hard wood, 10 ft. cord and plug. Shipping wt. 11 lbs. **PRICE \$35.50 ONLY**



Portable ELECTRIC HAND SAW

The Zip Sawer With **ALL the Features**
6 1/4" Diameter saw blade, 1/2" square arborhole. Maximum depth of cut 2 1/8". (At 45°, 1 3/4".) Minimum depth of cut 0". Angular adjustment 90° to 45°. No-load speed, 5200 r.p.m. Full load speed, 3200 r.p.m. Amperes, full load 8.0. Universal AC-DC motor, 110/220 volt. Dimensions: 11 1/4" long; 9 1/2" wide (ripping guide removed); 7 1/8" high (without blade). Furnished complete with 6 1/4" diameter combination blade and 10 ft. cord and plug. Wt. 11 1/2 lbs. Price.. **\$44.50**



WELLWORTH PAINT SPRAY UNIT



Wellworth 2 cylinder, piston type with 110 volt, 60 cy., A.C.-D.C. Heavy duty motor. Built in tank provides even air flow; safety valve; syphon type gun with quart aluminum cup; sufficient pressure for continuous spraying of lacquer, enamel, paint, insecticides, etc. at 25 to 30 lbs.; 20 ft. air hose. Complete instructions. Wt. 12 lbs. 1 year guarantee. **\$50.00 value Price only..... \$22.95**

PRICES F.O.B. CHICAGO. MONEY BACK GUARANTEE. SEND CHECK OR MONEY ORDER TODAY. PROMPT SHIPMENT. WRITE FOR CATALOG. SEND 10c FOR POSTAGE.

WELLWORTH TRADING CO.

1832 S. WABASH AVE. Dept. B-11 CHICAGO 16, ILL.

FREE



BOOKLET ON CARE AND REPAIR OF PLIERS

Here's the book for owners of good quality but long-used pliers that need a bit of "first aid". Simple instructions (with pictures and diagrams) on how to put them back in good condition. *Saves you money—saves America precious steel.*

How to remove rust, loosen or tighten joints, straighten jaws, renew jaw checking, sharpen cutting edges, etc. *Good quality pliers can usually be repaired readily.*

Send today for your FREE copy of the 8-page booklet, "First Aid for Pliers".

And, of course, if you really need new pliers, remember the name UTICA when you see your hardware dealer.



FREE BOOK Shows:

Advantages of FALL GARDENING!



ROTO-ETTE
Pat. U. S. Pat. Off.

—A DAY'S WORK IN AN HOUR!

105 eye-opening pictures! By Ed Robinson, famous "Have-More" Plan author. Demonstrates how amazing, low-cost ROTO-ETTE does day's work in an hour! How it prepares garden for Spring or Fall planting, then cultivates without attachment change. Pictures new Roto-Millers (pat. pdg.) that power compost, power mulch, power cultivate—while protecting roots from damage. Also shows Power Lawn-Making, Lawn Mowing, Field Mowing for fire protection, Wood Sawing, Water Pumping, Snow Plowing, Grading, etc. Send 10 cents (stamps or coin) to cover shipping FREE BOOK to you. ROTOTILLER, Inc., Dept. 3011, Troy, N. Y.

DO MORE PLANING JOBS WITH LOW-COST BELSAW \$215.00



AMAZING 12 1/4-IN. PLANER Does All Ordinary Planing Mill Jobs. Provides attachments for Jointing, Rabbeting, Tongue, Groove, Matching. 12 1/4 x 6-in. capacity, 3-knife solid round all-steel cutterhead. Power feeds at 24 feet per minute, 42 cuts per inch. Provides for full line of accessory attachments—Grind and Joint knives IN THE CUTTERHEAD WITHOUT REMOVING.

BELSAW MACHINERY CO

1021 Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

FREE BOOK



SOLVE!!!

GENERATOR AND BATTERY PROBLEMS WITH THE AMAZING NEW INVENTION
SELECT-A-CHARGE REGULATOR

WITH DASHBOARD CHARGE CONTROL FOR BETTER GENERATOR AND BATTERY SERVICE - LONGER - BRIGHTER LIGHTS WHEN YOU WANT THEM.

BULLETIN S-A-C FREE

GUARANTEED.

LIMITED DEALER TERRITORIES OPEN

SCIENTIFIC ELECTRIC CO. Box 2162-P, Sta. H, Cleveland, Ohio

ELECTRIC SHEAR SHARPENER

Over 75,000 Sold—It Must Be Good



Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

Motor driven

\$9.75
complete with vise

WILLIAM MARVY COMPANY, Dept. 12
479 St. Peter Street St. Paul 2, Minn.

D.C. ARC WELDER

\$300 VALUE—ONLY \$97.50

200 Amperes Continuous Duty. Up to 250 amps. Intermittent duty. Easily mounted on your tractor. Welding range from 0-up by dial type control. 1-yr. guarantee with money back 10-day trial period. Write for FREE literature. OR send 35c for PLAN "Build Your Welder from Aircraft Generator". Write today.

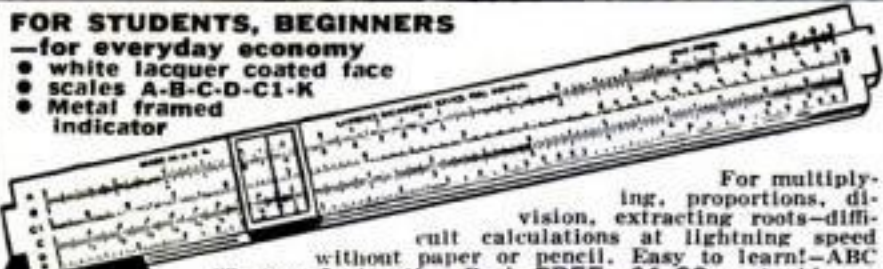


LEJAY MFG., 823 LEJAY Bldg., Minneapolis 8, Minn.

New Accurate 10" SLIDE Rule

FOR STUDENTS, BEGINNERS

- for everyday economy
- white lacquer coated face
- scales A-B-C-D-C1-K
- Metal framed indicator

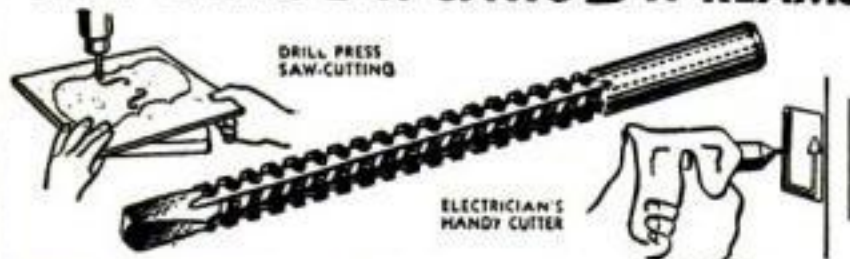


\$1 POST PAID

For multiplying, proportions, division, extracting roots—difficult calculations at lightning speed without paper or pencil. Easy to learn!—ABC 32 page Instruction Book FREE. \$1.00 postpaid. Professional Model: Scaled A-B-C-D-C1-K-S-L-T. Contact hairline index on back of rule insures accurate reading of "trig" Scales. With Leather Case. Instruction book. Complete. \$2.00 postage paid.

MINI-ADD, Dept. RP5-11, 108 5th Ave., New York 11, N. Y.

MILLER ROTARY HI-SPEED COPE-SAW DRILL-BIT IT DRILLS IT SAWS IT REAMS



DRILL, SAW, REAM metal, pipe, wood, plastic, Transite, etc. Use with any electric drill slow drill press, lathe or milling machine Drills own starting hole—upper part of bit is used to cut, saw or ream circles, ovals, squares or scrolls. Easy to operate. Ideal for carpenters, mechanics, electricians, plumbers, hobbyists, many others Abrasive resistant, high speed steel. Flutes ground from solid. Will withstand severe continuous use without breaking. Resharpener at no charge. Takes place of up to \$50 in tools 1/2" diameter, 2" cutting sections, total length 3 1/2" Also available specially designed for wood or metal and in 2 1/2" and 1 1/2" lengths. Write for details Specify all-purpose bit Shipped same day. Money-back guarantee Dealer inquiries invited

SEND CASH, CHECK OR MONEY ORDER

Manufactured and distributed by:
INTERNATIONAL TWIST DRILL CORP.
624 Wyandotte, Rm. 695 Kansas City 6 Mo

only
\$3.95
POST PAID

NEVER BEFORE—PERHAPS NEVER AGAIN—A TOOL BARGAIN LIKE THIS!

ALL METAL 8" TILT-ARBOR SAW

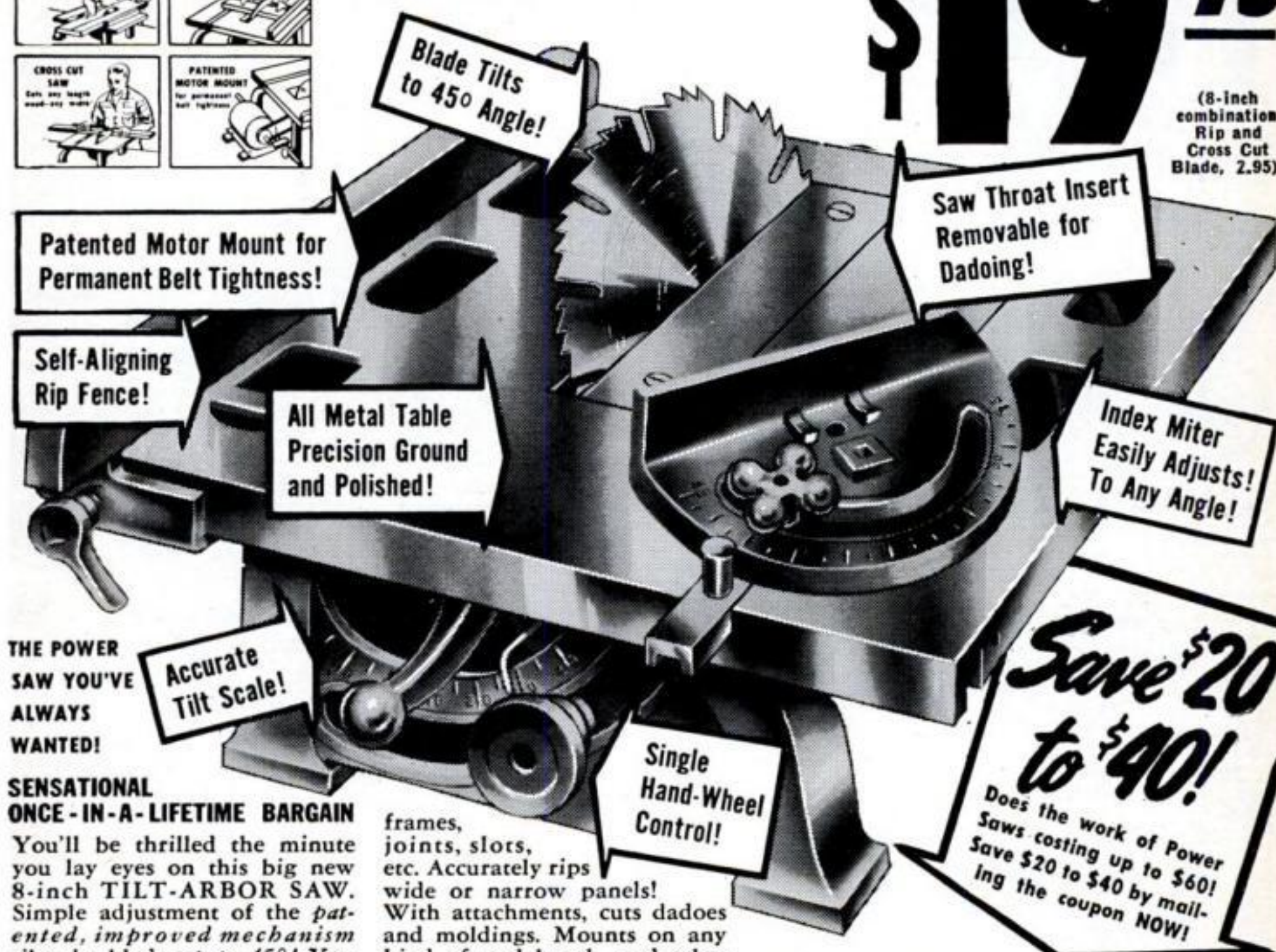


- BLADE TILTS TO 45° ANGLE! TABLE STAYS LEVEL!
- STURDY ALL METAL CONSTRUCTION!
- PRECISION GROUND AND POLISHED TABLE!
- BALL BEARING BUILT-IN MOTOR MOUNT!
- CUTS HARD OR SOFT WOODS—UP TO 2 1/2" THICK!
- OPERATES ON 1/4 OR 1/3 h.p. MOTOR!

AN AMAZING BARGAIN AT ONLY

\$19⁹⁵

(8-inch combination Rip and Cross Cut Blade, 2.95)



THE POWER SAW YOU'VE ALWAYS WANTED!

SENSATIONAL ONCE-IN-A-LIFETIME BARGAIN

You'll be thrilled the minute you lay eyes on this big new 8-inch TILT-ARBOR SAW. Simple adjustment of the *patented, improved mechanism* tilts the blade up to 45°. You can mitre, bevel or saw any length wood at any angle yet the table and the work are always level! Built-in patented ball bearing motor-mount eliminates complicated gears and keeps belt always at correct tension! Entire arbor rotates on just two pins! Has height lock for dadoing. Blade raises and lowers. Does everything a \$60 tilt arbor saw can do!

Cuts 2 x 6's in 2 1/2 seconds. Cuts joists, siding, rafters,

frames, joints, slots, etc. Accurately rips wide or narrow panels! With attachments, cuts dadoes and moldings. Mounts on any kind of tool bench, and takes any attachment that can be used on a power saw. Uses any standard blade with 1/2" bore. We absolutely guarantee that this is the power saw you've always yearned for—complete with amazing new, patented features for making your work better, cleaner, easier. Money back guaranteed if this rugged 8" TILT-ARBOR POWER SAW does not please you in every way. Mail the coupon at once while this offer lasts!

ROGERS PRECISION TOOL CO., 20 BOYSTON STREET, Boston 16, Mass.

Save \$20 to \$40!

Does the work of Power Saws costing up to \$60! Save \$20 to \$40 by mailing the coupon NOW!

ROGERS PRECISION TOOL CO., Dept. PS-11
20 Boyston St., Boston 16, Mass.

Please rush your new ALL-METAL 8-INCH TILT-ARBOR POWER SAW. I enclose ☐ check, ☐ Money Order for 19.95 plus 75c postage. If not delighted I may return the saw within 10 days for full purchase price refund.

Name.....

Address.....

City.....Zone.....State.....

☐ If 8" combination Rip and Cross Cut Blade is desired, enclose 2.95 extra and check square at left.

**BUY DIRECT
UP TO 85% DISC.**

See our other ad next page →

Make Snow Removal Real Fun! SNOW-BLO



The sensational device that makes snow removal real fun. Easy—a child can operate it. Safely guarded whirling impeller quickly scoops up the snow and blows it 25' either side. Big time-saver. Clears driveways and walks in a jiffy. Eliminates dangerous exhaustion and overtaxed heart, which kills so many every winter. BOYS! Make big money clearing snow for neighbors. Easily converted to lawn mower when desired. New silent electric model powered by 1½ hp. motor clears 16" swath. Complete with shockproof 100' cord. (Item 72) \$139.50
GASOLINE MODEL with easy starting 2 hp. 4-cycle engine (Item 73) \$159.50
SELF PROPELLED MODEL for large areas (2½ hp. engine) (Item 74) \$229.50
Self propelled model with 5 hp. engine (Item 75) \$269.50

We pay freight on Snow-Blos. Free with purchase of any model, an extra 100' extension cord.

GIANT BUNSEN BURNER



(Item 61) Operates equally well on gas or ordinary alcohol. Economical. 1 pt. burns for hours. Produces intense blue smokeless flame. Ideal for lab. or as emergency cooking unit. Fine for camping. Heavy brass burner with shut-off and adj. valve. Simple and safe. 5 ft. flex. hose, 1 qt. tank incl. Wt. 5 lbs. A \$15 value. \$4.95

GEM CUTTER

(Item 49) Complete Prof. Lapidary mach. for cutting, shaping, grinding and polishing precious and semi-precious stones. Precision built with big horiz. power driven gem cutter, built-in cutting lubricator; genuine 3" supercharged diamond saw, lap wheel, abras. whls., 2 scratch whls., 4 felt whls., grinding and polishing compounds, brushes, dope cement and sticks, cutting oil, ext. cord, asstd. gems, complete instructions. Requires ¼ hp. motor (not incl.) Wt. 22 lbs. Worth \$99.50. Our Special \$39.95



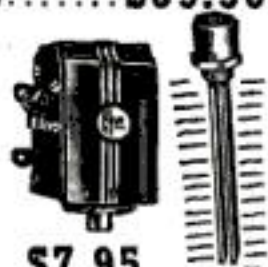
G. M. HI-FLO PUMP



(Item 56) 210 gal. per min. Centrifugal turbine type. Unexcelled for fire-fighting, irrigation, sprinkling systems, swimming pools, drainage, fuel transfer, etc. Built by GM for the Army at a much, much higher cost. Tremendous volume, will deliver 210 gpm with 5.3 hp. down to 40 gpm with 1½ hp. 2½" stand. pipe thr. inlet (can be reduced to 2" if desired). Twin 1¼" outlets. Dynamically balanced, ¾" shaft, hi-speed ball bearings. Easy fast priming (instr. incl.) Wt. 36 lbs. Sensational value. \$39.50

ELECTRIC WATER HEATER

(Item 76) Immersion type 115 v AC—1250 watts. Convert your present tank to modern automatic hot water heater. Long life Westinghouse or Chromalox element screws into std. 1¼" opening in tank. Adjustable thermostat keeps water at desired temp. Can also be used in washing machine or tub. Wt. 8 lbs. Heater element and thermostat regularly \$49.50. Spec. \$14.95



ANGLE DRILL

(Item 23) Fits into chuck of any electric or pneumatic drill or flex. shaft. Operates at any angle in a full 360° arc. Makes possible drilling, grinding, carving, routing, etc. in close cramped quarters. Makes impossible jobs easy. Made by Kelt Tool Co. Complete with built-in chuck (¼" capacity) and adjusting key. Hardened alloy gears. Precision built for heavy duty. Lists at \$39.95—while they last. \$9.95

TIRE CHAINS

(Item 43) Extra heavy for dual truck tires, 7.50x20, triple spec. \$19.50

A-C ARC WELDER

Master Hi-Line A-C Arc Welder, 20-190 amp. output. (Item 168). Welds or cuts iron, steel, brass, etc. from 24 gauge to 5/8" with single pass. Operates from 220/230 V. 50/60 Cycle A-C line. None better. Meets REA requirements. Handles 1/16" to 1¼" rods. Adjustable output for any job. In sturdy steel cabinet, on casters. Full instr. and 1 yr. guar. incl. Wt. 210 lbs. \$159.50
Reg. \$250 value.
(Item 169) 20-100 amp. A-C Welder operates on 110 or 220 V. Wt. 65 lbs. \$64.95
Worth \$125.



(Item 181) Welding Kit incl. helmet, 2 leads, electrode holder, ground clamp, power cord and rods (sold only with welder) Wt. 12 lbs. \$12.50

CLIP BOARD

(Item 17) Heavy Masonite, with self-adjusting spring hinge to hold up to 100 sheets of 8½x11 paper. Push back cover for instant release. Flip cover shut and notes or drawings are protected. Perfect for pilots, engineers, students, artists, truck drivers. Wt. 2½ lbs. Usually \$2.95. Spec. \$1.10, 2 for \$2.00.



MANUFACTURERS AND JOBBERS—

Write us about your surplus items

All items brand new. Prices F.O.B. Chicago area. 10 day money back guarantee. Send check or M.O.

MASTER MECHANIC MFG. CO.

Dept. 83

Burlington, Wis.

Gas-Plating Process Now Rivals Electroplating

Gas plating, under development during the past three years, is proving a novel and successful way of applying metal coatings. Unlike electroplating, it needs no electric current or liquid baths.

Objects to be plated are simply placed in a chamber containing a gaseous chemical compound of the metal to be applied. Heat decomposes the compound and rapidly deposits a coating of the pure metal, which may be nickel, chromium, iron, tungsten or molybdenum.

Carbonyl Compounds Used

The process makes use of an unfamiliar and interesting family of metallic chemicals called the carbonyls. An example is nickel carbonyl, whose chemical formula is written as Ni(CO)₄. It is formed when metallic nickel combines successively with oxygen and with carbon monoxide. In commercial form, nickel carbonyl is a volatile liquid supplied in steel cylinders. Bubbling inert gas through it fills a plating chamber with its vapor. A temperature of about 356° F. decomposes the nickel carbonyl into nickel and carbon monoxide gas, and the metal is deposited in a film. Apparatus has been developed to apply the coating to articles on a production-line basis.

Gas plating yields a metal coating in a small fraction of the time required by other methods. Nonconductors of electricity can readily be plated, including paper, plastic and tile; and semi-transparent nickel mirrors have been produced upon plate glass. Another advantage of gas plating is that irregular surfaces and interior parts of objects can be plated without special equipment. Both nickel carbonyl and carbon monoxide are poisonous, and nickel carbonyl is also explosive when mixed with oxygen, but these hazards can be overcome by proper equipment.

The technique of gas plating has been developed by the Commonwealth Engineering Co. of Dayton, Ohio.

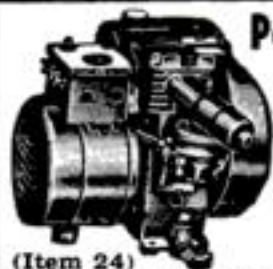
Boiling Water Can't Get Hotter

You can raise the flame under your pot of coffee as high as you want, but the coffee won't get any hotter. The increased heat will turn more of the boiling liquid into vapor, but it can't increase its temperature.

**BUY
DIRECT**

- MASTER MECHANIC -

UP TO 85% DISC.



Portable LIGHT PLANT

PUSH BUTTON START
500-700 watts 110-120 v. — 60 cyc. A.C. Powered by a sturdy dependable, easy starting, air cooled 1 1/4 hp. gas engine. No wiring necessary. Plug in and operate. Plenty of current for any oil burner, freezer, brooder, pump, emergency lights, etc. which require up to 700 watts. Ideal for Civil Defense, Fire Depts.; trailers & camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. Wt. 85 lbs. Fully guaranteed. Be prepared if war or storm knocks out power lines.

(Item 24) Reg. \$275.00 value. **\$143.50**
700-800 Watt Plant (Item 44) same as Item 24, but greater output. **\$169.95**
1000-1200 Watt Plant (Item 45) same as Item 24, but larger generator & engine. **\$199.50**

GIANT 2000-2500 WATT PLANT

110-120 V. 60 cyc., A.C. Absolutely the best made because its heavy windings develop up to 5000 watt overload for motor starting. Skid-mounted—portable. Powered by 5 h. p. easy starting Briggs or Wisconsin engine—complete with all accessories; engine easily disconnected for other uses. Big outlet box, voltmeter, no wiring necessary. Ample current for all purposes. Factory warranty and instructions included. Wt. 220 lbs. Reg. \$585.00. Special at... **\$299.50**
GENERATOR ONLY and control box. \$169.50
Drive it with your engine or tractor

We Are World's Largest Mail Order Distributors of Light Plants

38 Pc. DRILL KIT

(Item 35) Includes hi-power smooth-running guar. 1/4" drill, buffers, polishing bonnet, sanding discs, grinding wheels, wood bits, steel bits, wire wheels, bench stand, paint mixer, burrs. Complete in steel case. Wt. 13 lbs. 38 pc's., all highest quality. Complete kit worth \$38.50. Our **\$19.85** Spec. only...

ACCESSORIES FOR 1/4" DRILL

Make complete workshop out of your 1/4" drill, using these practical accessories. Quick change—merely insert shaft in drill chuck. Sturdy, heavy duty tools for real work. Precision built of hardened tool steel. Factory guaranteed against breakage.

POWER HACK or JIG SAW

(Item 64) makes straight or curved cuts easily in plywood, 3/4" boards, sheet metal, plastics, etc. Uses broken hack saw blades. Will do filing, jig saw, coping saw and sabre saw work. Compares with \$50 tools. Wt. 3 lbs. Special... **\$16.95**

ELECTRIC HAND SAW

(Item 66) The famous Arco-Saw converts any 1/4" or 3/8" drill into a powerful electric saw. Exclusive features—one hand operation, visual guide bevel and angle adjustments, rip gauge depth gauge. Depth of cut 1-5/16". Self lubricated for life. Wt. 3 lbs. Complete with 4" blade. **\$11.50**

Power Sander & Polisher

(Item 85) Make quick work of slow tedious sanding jobs. Big 21 sq. in. sanding surface. Produces powerful lengthwise sanding stroke which results in beautiful smooth finish. Built-in rubber pad. Sandpaper held in place by quick-change spring-clips. No messy adhesives. Use felt pad for polishing. Using drill motor for power gives you equivalent of an \$85 sanding machine. Wt. 3 lbs. Terrific value at... **\$16.50**

FIRE EXTINGUISHER

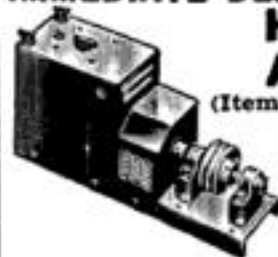
(Item 39) Fully charged at 1,000 lbs. P. S. I. or more) with CO2 (carbon dioxide), the proven miracle fire fighting chemical that smothers oil, gasoline and electrical fires. Play safe; keep one in your car, garage and home. Heavy ICC approved steel cylinder, valve and 3000 lb. gauge that shows available remaining pressure. REFILLABLE at nominal cost. Hose included for emergency tire inflator or air blast. Wt. 4 lbs. **\$19.50** value. Special... **\$6.95**

LARGE FIRE EXTINGUISHER

(Item 57) commercial size, 5 x 14 in. (275 cu. in.) heavy ICC approved steel cylinder charged at 1000 lbs. or more with CO2. Equipped with genuine Kidde Valve. Refillable. Hose incl. Suitable for fire depts., stores, garages, homes, etc. Wt. 18 lbs. \$42.50 value. Spec. **\$15.85**

IMMEDIATE DELIVERY ALL ITEMS

HEAVY DUTY ARC WELDER



(Item 38) Use as portable or shop welder. 250 amps, D.C., Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Weld up to 1/2" plate using 1/4" rods. Built-in air-cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-lo switch and dial control gives wide range of welding heats. Run welder at 2600 rpm. with tractor, jeep or 10 hp. gas engine, or 7 hp. elec. motor. Complete with instructions, guar. and double V belt or flat pulley. Wt. 110 lbs. **\$99.75**

MAGIC TERMINAL model same as above but with built-in 3rd terminal for low heat soldering and brazing. Special... **\$119.50**
WELDING KIT. Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at... **\$10.50**

28 pc. BENCH GRINDER KIT

(Item 71) A rugged precision Grinder powered by 1/4 hp AC 110 v. 3500 rpm heavy duty motor. Equipped with tool rests and non-breakable safety eye-shields. 28 pc. kit incl. 2 grinding wheels, wire wheel, drill chuck, arbor, asst'd drills. 14 sanding and polishing discs, buffs, etc. All highest quality. 1 year guar. Wt. 17 lbs. Drastically reduced... **\$21.95**

CARRY-AIR



(Item 32) Stainless steel tank—capacity 500 cu. in. at 400 lbs. press. complete with inlet and shutoff valves, press. gauge, detachable air hose, tire chuck. Fill at any service station. Carry air for tire inflation, blowing out lines, spray painting, insecticides, etc. One emergency pays back cost. Wt. 10 lbs. Worth \$20.00. Our price... **\$8.95**

(Item 55) With big double tank (1000 cu. in.)... **\$11.95**

POTTERS WHEEL

(Item 47) Complete, prof. equip. for making finest ceramics and pottery. Large dynamically balanced cast-aluminum reversible turntable with variable speed drive (38 to 140 rpm) controlled by foot-pedal. Built-in adjustable arm rests, water cup and wedging wire. 16x12" enclosed throwing table—ample area for largest pieces. Req. 1/4 hp. motor (not incl.). Can be set up on 20x24" table and stored on edge. Complete with pulleys, belts and instructions. Wt. 26 lbs. **\$59.95**

32 pc. SOCKET SET

(Item 59) Highest quality guar. non-breakable sockets made by Plomb, Snap On, etc. Complete range of 22 sockets from 1/4" thru 3/4" in 3/8" drive and 7/16" thru 1-1/16" in 1/2" drive. 2 speeder handles, 2 extensions, 2 slide heads, double 3/8 x 1 1/2 in. "L" handle, reversible ratchet, 12" Phillips type screw driver and metal tool box. For professional mechanics who want the best. Wt. 14 lbs. Easily worth \$32.50, while they last... **\$15.95**

RUBBER HOSE



New genuine Neoprene Hose — outlasts ordinary rubber 3 to 1. Reinforced with super tough cotton cord plies. Flexible. Easy. Flo brass couplings with standard pipe threads for quick connections, included. Pump water for irrigation, stock tanks, home, barn, fire fighting, etc. Pump Gas or Fuel Oil. Save more than 60%.

TERRIFIC VALUES!

(Inside Diam.) 1" 1 1/4" 1 1/2" 1 3/4"
Length 10 ft. 25 ft. 40 ft. 30 ft.
Price 5.95 9.25 14.75 14.75
If specified we will send special hose for gas or oil at same prices.

HYDRAULIC HOSE

High pressure, heavy duty, complete with swivel fittings. Pipe thread connections. Ideal for farm equip., bulldozers, grease guns, airbrakes, etc. Any length. Minimum \$1 per lft. **INSIDE DIAMETER,** 1/4" 50¢ per ft. 3/8" 60¢, 1/2" 80¢, 3/4" 90¢.

Send 10¢ for a Big War Surplus Catalog. Included Free with Every Order.



EXTENSION CORD

(Item 16) 40 ft. heavy duty, made of specially insulated No. 14 2-conductor wire. So tough that you can drive over it and yet amazingly flexible and easy to handle. Resists oil, grease or water. Extends electricity up to 400 ft. without voltage drop. Use indoors or out. Complete with heavy rubber plug and outlet. Wt. 2 1/2 lbs. Usually \$4.50—Special 40 ft. **\$1.99**
Comb. 2-40 ft. and 1-20 ft. (total 100 ft.) **\$4.95**
100 foot length (one piece)..... **\$4.85**

WIRE ONLY (Item 50) No fittings, 100 ft. **\$4.00**

TRENCH-LAY WIRE. (Item 51) **Anaconda** #10—2 cond., for buried service to barns, outdoor lights, etc. Absolutely impervious to soil and moisture. Wt. 25 lbs. per 100 ft. Special surplus price, 100 ft. coils, 19¢ per ft.; 250 ft., 18¢ per ft.; 500 ft., 17¢ per ft.

POWER CABLE (Item 67) #12—2 cond. stranded, flexible, vinyl covered, impervious to everything. 50 ft. wt. 7 lbs. **\$15.95**

TELEPHONE WIRE. (Item 52) Genuine U.S. Army Signal Corps qual. #18—2 cond. reinf. with steel strands for great strength. 1/2 mile coil, wt. 60 lbs. **\$9.95** 2 for **\$18.50**.

HEATING & VENTILATING FAN

(Item 10) Easily installed in furnace pipes. Forces even heat to all rooms. Over range, removes kitchen smoke and odors. Powerful continuous duty motor, 110-120 V. A.C. Quiet, super efficient fan moves huge volume of air (400 to 600 c.f.m.) 8" Fan, wt. 5 lb. **\$6.35**; 9" Fan, wt. 6 lbs. **\$7.45**; 10" Fan, wt. 7 lb. **\$8.45**; 12" Fan, wt. 8 lbs. **\$9.45**.



HIGH PRESSURE HAND PUMP

(Item 53) Positive displacement type. Cap. 550 gph. Completely self priming. 3/4" pipe thread inlet and outlet. Use for fuel or water transfer on boats, trailers, air craft, etc. Ideal for insecticides, emerg. sump pump or as vacuum pump. Wt. 15 lbs. Govt. cost \$95. Our Special... **\$12.95**

VARIABLE SPEED SELECTOR

Heavy duty, made by B. F. GOODRICH for industrial use. Provides instant speed changes for any drive. For machine tools, dryers, printing, conveyors, production lines, hoists—any operation requiring variable speed. Ideal for midgeut autos. Employs reliable "trouble free" planetary system. No hydraulic power losses or creeping. Infinite range, smooth operation, easy installation. 3 sizes: 1/2-1 hp. wt. 36 lbs.; 1-2 hp. wt. 55 lbs.; 2-3 hp. wt. 105 lbs. Reg. list \$228, \$252 and \$352. Brand new, in Goodrich boxes and guaranteed. Complete installation data included. Unprecedented surplus sacrifice **\$79.50, \$89.50 and \$114.50**.



ELECTRIC HAND SAW

(Item 36) Most perfectly balanced and smoothest running saw made. Advanced design provides max. power and light weight. Easily adjusted for all angles, depth and width of cut. Comes complete with 8 1/4" comb. blade, ripping guide and 10 ft. hvy. duty cord. Built-in sawdust blower. Autom. telescoping guard. 110-120 v. AC-DC. Depth of cut 2 1/4". 1 year written guar. Wt. 12 lbs. Drastically reduced... **\$39.95**

GAUGE TESTER

(Item 27) Precision made of solid bronze and steel by Ashcroft. (Cat. #1300-5). Calibrated weights (incl.) acting against hydraulic piston provides quick accurate testing of all pressure gauges up to 500 psi. Brand new. Wt. 90 lbs. Reg. \$318.00. Our Spec. **\$95.00**

8" TILTING ARBOR SAW

Terrific Value. Heavy duty 3/8" double ball-bearing arbor. Saw blade tilts, table remains level. Big 12"x16" precision ground table. (Extensions to 24"x16" avail.) Micrometer hand wheel controls tilt and depth—2 1/2" cut. Cross-cutting, ripping, da-doing, sanding, bevel and angle cutting, all easily performed. Essential for all cabinet work. Motor carriage, mitre-gauge, rip-fence, splitter, guard and blade incl. Compares with saws selling at \$89.50. Deluxe Ball-Bearing model (Item 69) **\$44.95** wt. 34 lbs.

Bronze-bearing model (Item 70) 1 1/2" **\$27.50** arbor, table 10"x13", wt. 34 lbs.

All items brand new. Prices f.o.b. Chicago area. 10 day Money back guarantee. Send check or M. O.

MASTER MECHANIC MFG. CO., DEPT. 83

Burlington, Wis.

**Jiffy-sharp
tool edges
are easy
WITH A . . .**

**NORTON
abrasives**

CRYSTOLON® #JB-8



A tool is only as good as its edge, and nothing sharpens tool edges faster than a CRYSTOLON Combination Benchstone. No messy home soaking either, because CRYSTOLON Benchstones are oil-filled at the factory. Professionally-keen tool edges are yours every time with a CRYSTOLON. At hardware stores—or write direct.

Take all the mystery out of sharpening. For the complete know-how on all shop, garden, and household tools, send for clearly illustrated 32-page "How to Sharpen" Book. Mail only 10c to Dept. PS-11.



BEHR-MANNING • Troy, N. Y.

**COATED ABRASIVES
SHARPENING STONES • MASKING TAPES**



**Send for this
BIG NEW
Hunt's
WOODWORKERS
CATALOG NO. 18**

NEW LOW PRICES

Offers greatest selection of fine domestic and imported woods—and hundreds of woodworkers items at bargain prices!

You'll save time and money with this big, new catalog. Contains everything wood craftsman needs. Shows 32 rare and fancy woods in color...43 veneer designs...275 scroll patterns...multicolor inlays, overlays, bandings...all kinds of tools, machinery, cabinet hardware, ornaments, mouldings...and pages of valuable tips, ideas, information, instruction. Send for your copy NOW. Only 15c.



• 144 PAGES

• **QUICK
DELIVERY**

• on maple, poplar, oak, mahogany, red cedar, cherry, walnut, and many others—all properly seasoned and kiln dried.

MAIL THIS COUPON—TODAY!

CRAFTSMAN WOOD SERVICE CO.

2729 S. Mary St., Dept. B-11

Chicago 8, Illinois

Send me the big, new, money-saving Catalog No. 18. Enclosed is 15c.

Name _____

Address _____

City _____ Zone _____ State _____

DYNAMIC POWER TOOL COMBINATION



INCLUDES: Cummins 1/4" Electric Drill; Cummins Saw Attachment; Combination Saw Blade; Set of Drills; Lambs Wool Bonnet; 6 Sanding Disks; Steel Arbor and Attachments; Cloth Buffing Wheels; Grinding Wheel; Wire Wheel Brush; Steel Paint Mixer; Steel Bench Stand; Portable Steel Carrying Case.

Price of Dynamic Power Tool Combination complete is \$26.95

**SHIPPED ON APPROVAL
NO MONEY WITH ORDER—NO C. O. D.**

Try it ten days before you buy. If completely satisfied then send \$2.95 and pay balance at rate of \$4.00 per month for 6 months—No Interest or Carrying Charges Added. If not completely satisfied, return to us, no explanation necessary.

KAPNER HARDWARE, INC.

Dept. A-7, 2248 Second Ave., N. Y. 29, N. Y.

SPECIAL OFFER!

**LOCK-STITCH
SEWING AWL**

**\$1.
Postpaid**

Famous, patented lock-stitch sewing awl complete with needles, waxed thread and direction folder. Hundred uses — sewing, repairing leather goods, canvas, belting, harness, saddles, gun cases, awnings, golf bags. Extra needles and thread available. Satisfaction guaranteed or money back. Send currency, check or money order. Yates Mfg. Co., 611-K Main St., Lake Geneva, Wisconsin

DRAINS Cellars, Laundry Tubs; CIRCULATES Oil; IRRIGATES Gardens

Original "Type P" Pump has 2400 GPH capacity. 360 GPH 75' high, or 1500 GPH from 25' well. Use any 1/8 to 1/2 HP motor. DOES NOT CLOG. 1" intake; 3/4" outlet.

Only \$6.95 postpaid if cash with order. (West of Mississippi, add 50c.)

SATISFACTION GUARANTEED OR MONEY BACK!

LABAWCO PUMPS, BELLE MEAD 3, N. J.

\$6.95



ELECTRIC WELDER

AC or DC 110 Volts

"The Little Marvel" All-Metal welder. 5-year written guarantee. Welds 1/8" thick metal or money back. Repairs tanks, tools, fenders, machine parts, etc. Comes complete with everything—rods, unit, eye shield, and directions. We also make a welder for 16 to 22 gauge metal. \$3.95 complete. Transformer welder kit \$15.95. On C.O.D., postage extra.

ESSAY MFG. CO., Inc., Dept. 47, Quincy 69, Mass.

**\$6.45
Complete**

BUY U.S. SAVINGS BONDS



HURRICANE EXHAUST

CUT-OUT

This specially engineered cut-out enables you to install special pipes and mufflers without removing the original muffler.

Now control your exhaust tone from a dash control button. Cut back into your original muffler in restricted areas at will.

This cut-out is well constructed; actually strengthens exhaust pipe; made of heavy plate steel, designed for easy installation—no special tools required. Fits all exhaust pipes from 1 3/4" to 2 1/4" size. Sent postpaid for only \$6.95 check or money order. Satisfaction guaranteed or your money back.

ST. LOUIS PRODUCTS CO., Box 24-B, Normandy 21, Mo.

YOU can find over 100 PRACTICAL USES and have LOTS OF FUN with

5 in 1 Miracle Projector

Electric Enlarger and Copy Maker

Magnify & Project

Stamps, coins, puzzles, clippings, maps, science specimens, plans, etc. Examine magnified details. Project on paper and sketch copies, large or small. Easier reading for weak eyes.

Magnifying Reader for Small Detail & Print



Amazingly Useful Invention

Home—Fun—Schools—Salesmen—
Clubs—Artists—Teachers—Shops—
Sign Makers—Doctors—
Classroom—Scientists—
Students—Money
Maker—Photo-
graphs—Lab
workers—
Printers—
Painters
Etc.,
etc.,
etc.

**HIGH FIDELITY,
TRUE VIEW,
FULL
COLOR**

Learn to Draw & Sketch Signs, Cartoons, Pictures Easily

Posters, Lettering, Comics, Objects

Project sketches, pictures, objects, etc. on drawing paper. Sketch over with pen, pencil, colors, etc. Easy to make any kind of cartoons, drawings, signs, etc. either large or small. Make cartoons from pictures. Easy to do; no skill, no practice.

Copy Any Picture or Object

Project and focus it large or small. Make enlargements of plans or drawings. You'll be surprised how many practical and entertaining uses you can make. Advertising posters, cartoon sketches of friends, etc., etc., etc.



Natural Moving Pictures

Projecting Microscope Gives Live Show

Put ants, insects, flies & other bugs or animated objects under glass & let them walk around. See them in action greatly enlarged and magnified MOVING on screen. Amazing, real-life scientific motion pictures. Like having a projecting microscope.



Make Photo Enlargements and Copies Without Negatives!

Use Any Photo or Picture

Direct positive photo enlargements and prints without negatives using Eastman direct positive paper. Use any black & white or color picture, colored transparency, etc. Easy to do; excellent results. No complicated dark room equipment. Makes correct copy (same as original), large or small. Also useful for making copies of important papers, plans, documents, stamps, sketches, maps, etc., etc. EASY, FUN, USEFUL, PROFITABLE.



Picture Enlarger and Projector

Project 3-Dimension Pictures



Put on your own show by projecting snapshots, pictures, post cards, photos, comics, clippings, etc. on wall or screen. Fine for school, clubs, talks, home shows, telling about your trip, salesmen, etc. Full color, correct projection, entirely readable & correct. Special device enables you to project real 3-dimension or stereoscopic pictures. Startling, life-like.

Make Money---Machine Pays for Itself

Many ways to make money. Make photo enlargements, photo copies, give shows, make sketches and drawings and advertising signs, etc. Easy to do—the machine does the work.



\$3.98
Plus
35c
Postage

JOHNSON SMITH & CO.
Dep. 452, Detroit 7, Mich.

Projects & enlarges in full natural color; projects reading matter correctly, readable. Clippings, pictures or sketches, color transparencies as well as small objects in brilliant natural colors, brightly lighted up by electric light inside projector.

Different Show Every Night; No Films

to Buy; No More Expense; Sports, Girl Beauties, Comics, Etc. Your favorite SPORTS MOVIE or COMIC PICTURES from papers & magazines. Enlarge action pictures. Project snapshots of your girl, family trip. Project and read comic strips to kids. Large pictures projected in full color!

Educational, Scientific; Real Life Action! Live ants, flies, bugs and small animals can be projected on screen; watch them in real life action, fighting, eating, playing. Great for amateur scientist experimenter and camera fan.

Make Signs, Sketches, Posters, Cartoons, Lettering, Etc. Quick! Easy! In Black & White or Full Color; From Clippings or Copy; Large or Small. Make sketch or cartoon of friends. Posters and signs for clubs, stores, dances. Easy to make, large or small. Project picture or rough sketch right on blank drawing paper. Using pen, pencil or colors, sketch OVER PROJECTED PICTURE. Project photos and make funny, life-like cartoons or sketches. Amazing & practical. Be a good artist, even though you never did it before! Lettering and signs easy to do.

Magnifies Stamps, Specimens, Objects for Close Examination; Reader for Weak Eyes ABOUT 50 TIMES. Make photo enlargements direct from objects! Enlarges small type, maps, etc., projecting it for easy reading.

Photo Enlarger; Makes Photo Prints, Photo Copies, Etc.—No Negatives

Uses Eastman direct positive paper. Correct true-image photos, large or small, from any photo; or even from color prints & color transparencies. Photo enlargements, copies, etc., done cheaply, quickly, easily. 8x10-in. enlargement costs 12c; sell up to \$1.00. NO NEGATIVES. Made by projecting picture on direct positive printing paper. Duplicate copies of blueprints, diagrams, papers; large or small. By special process you can project 3-dimensional pictures and see in startling, life-like realism, so real you expect to reach out and touch them! Project beautiful girl pictures, travel scenes, etc.

No Skill—No Experience—Fun All Year Round Low-priced instrument that quickly pays for itself. No experience and no skill to operate. Just plug into any 110-volt AC-DC standard home socket. Years of entertainment and practical uses for every member of the family. Lasts indefinitely; nothing to wear out, so only cost is low price of MIRACLE PROJECTOR. Schools, shops, offices, artists, etc., all find many uses for it.

Project on Table, Wall or Ceiling—No Screen Necessary Project almost anywhere—even on table. No screen necessary—any blank wall or white paper will do. Wonderful for classroom, clubs and salesmen. Complete except for lamp bulb; use any household 60 to 100 watt lamp bulb. Steel construction, handsomely enameled in brilliant colors. Easy carrying: 7 1/2-in. high, 10-in. long. Optically ground and polished lenses; slide focusing so you can PROJECT FROM VARIOUS DISTANCES to make picture large or small. Takes pictures up to 3 1/2 x 4-inches. With illustrated instruction booklet, views, etc. (SPECIAL: 2 for \$7.98 or 3 for \$11.75, Postpaid) **\$3.98**

COMPLETE, CASH PRICE ONLY. (Add 35c Postage)

What Users Say: Artist & Signmaker: "Valuable aid; enables anyone to do all kinds of art money saver." Teacher & Lecturer: "Makes talks ten times more interesting. Teaches faster, more fun." Collector: "Magnifies & illuminates specimens for easy study"

**Rush
This
Coupon
Today!**

Johnson Smith Co., Dept. 452, Detroit 7, Mich.

(Since 1914 America's Leading Novelty House)

Rush . . . Projectors

Each \$3.98, plus 35c post.

Enclosed is \$

Special: 2 for \$7.98 Postpaid
or, 3 for \$11.75 Postpaid

Name

Address

(Sorry, No C.O.D.'s at This Cash Price)

Parking Meters Yield \$50,000,000 a Year

[Continued from page 171]

of the Chamber of Commerce, the parking problem smacked him in the face.

In struggling for a solution he evolved the idea of a timing device to indicate how long a car has been parked. Magee took his idea to Oklahoma A. & M. At that college Gerald A. Hale, professor of mechanical engineering, became so interested he quit teaching to enter partnership with Magee. Hale worked out the essential mechanism.

Hostile Merchants Won Over

Then, on July 16, 1935, the city awoke to discover 150 meters installed. For test purposes they were placed on one side of the street in one block and the other side in the next. Thus every block along the business streets had a free side and a metered side. National attention had been aroused. The wire services had teletyped articles throughout the country. Newsreel cameramen were at hand.

Hale remembers that morning vividly. By 9 o'clock the free side of each block was filled with cars, and the metered side was discouragingly, blankly empty. Merchants on the metered side reacted quickly with telephoned complaints to the City Hall. Some of them burned the wires. By 11 o'clock, as shoppers came to town, the metered sections began to fill, with a steady turnover of cars. Throughout the day the metered sections remained relatively full, but a motorist could always find a parking place. The non-metered side had slow turnover. By the end of three days merchants on the free side had petitioned the City Council to install meters on their side, too.

Meters Win Court Tests

But the going in those first years was slow. In 1936 about 8,000 meters were sold; and the next three years brought average sales of only 4,000. The meter business didn't begin to boom until 1946, when postwar prosperity brought intensified parking problems.

Parking meters have resulted in suits in 28 states. Most frequent plaintiff is the merchant who demands the right to park his own car free in front of his store. Courts in 24 states have held in favor of the meter, ruling that the businessman has no control over the street. In four states rulings were against the meters on the ground that they

constitute unauthorized taxation. In these states, however, legislative action later made the meters valid.

Two other problems have plagued the parking-meter industry; how to make the meters foolproof, and how to make them theftproof.

A segment of the American public accepted the parking meter as a challenge to its ingenuity. Chewing gum, hairpins, paper clips and cardboard stopped up the coin receivers. Slugs have not caused as much trouble as had been expected. How to prevent theft brought some head scratching. Today meters may be equipped with sealed coin cases which are replaced by the collector but cannot be opened by him.

Meters Make Money

While the major purpose of the parking meter is to help break the parking bottleneck in central business sections, it has proved to be a rich source of revenue for city government. Oklahoma City by October 1948—13 years after the meters were installed—went over \$1,000,000 in total collections. Cleveland has passed the \$2,000,000 mark. San Francisco in a single year netted \$735,486.94. Dallas averages \$275,000 annually.

By and large, the revenues go into general city funds. However, there is a trend, backed by the National Safety Council and other concerned organizations, to earmark these revenues by legislation for the improvement of traffic conditions. About one-third of the cities apply the meter intake to improving traffic conditions, for example by establishing parking lots.

What's the future for the parking-meter industry? Have we reached the saturation point? The various company officials interviewed were optimistic on this score. New improvements in meters bring orders for replacements. Many cities have now begun installing meters in suburban areas. But most fruitful of future sales is the municipally owned parking lot. Many cities have begun to operate parking lots with meters. These meters will permit parking for 12 minutes for one cent and on up to ten hours for 25 cents.

It looks as though you and I might just as well make up our minds that we'll be putting coins in parking meters for a long time to come.

END

This One



BFK1-1NW-BND8

TRY THIS TUBE

you'll be convinced!



It is the best glue for all fine wood-work. It makes joints so strong they cannot be opened without wood failure, yet so thin you cannot see them when grain is matched. Long lasting, hide glue was used in museum pieces centuries old. This hide glue is the easiest to use, yet the finest glue for all home craftsmen.

It's genuine HIDE glue . . . strongest known
That's the secret of Franklin popularity. Once a craftsman realizes that this is the same glue as he has used, but without any of the trouble of heating, mixing, etc., it's the only glue for him from then on.

No mixing or heating . . . ready-to-use
That means no danger of chilled joints, no waste, uniform from first drop and every drop works.

Economical—no waste
Actually costs less than any ordinary glue because it spreads so thin and goes farther.

No odor—no muss
Unbelievably pleasant to use. A favorite in furniture factories, schools and at home.

15¢ AT ALL
HARDWARE
STORES

SIX SIZES . . .

Available in tubes, 15c; ideal for a trial; quarter pints, 50c; half pints, 85c; pints, \$1.50; quarts, \$2.65; and gallons, \$7.50 at most good hardware stores. If your dealer cannot supply you

SEND THIS COUPON

with 20¢

Send 20c for the large tube (15c plus 5c for postage and wrapping).



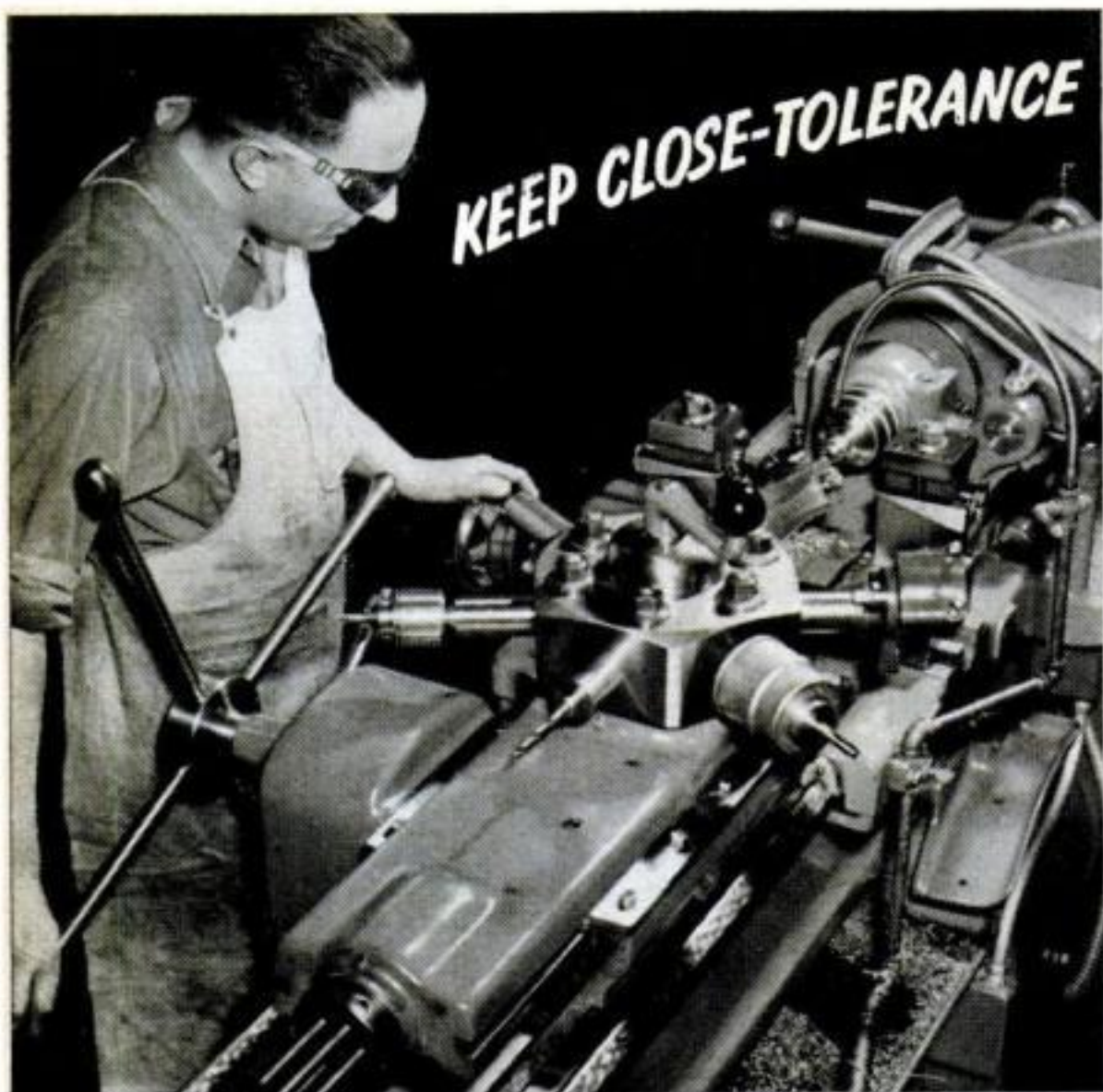
THE FRANKLIN GLUE CO., 115 W. Chestnut St.
Columbus 15, Ohio

Enclosed 20c (15c plus 5c postage and wrapping charge) for a trial tube of Franklin Liquid Hide Glue.

NAME _____

ADDRESS _____

SEND
THIS COUPON

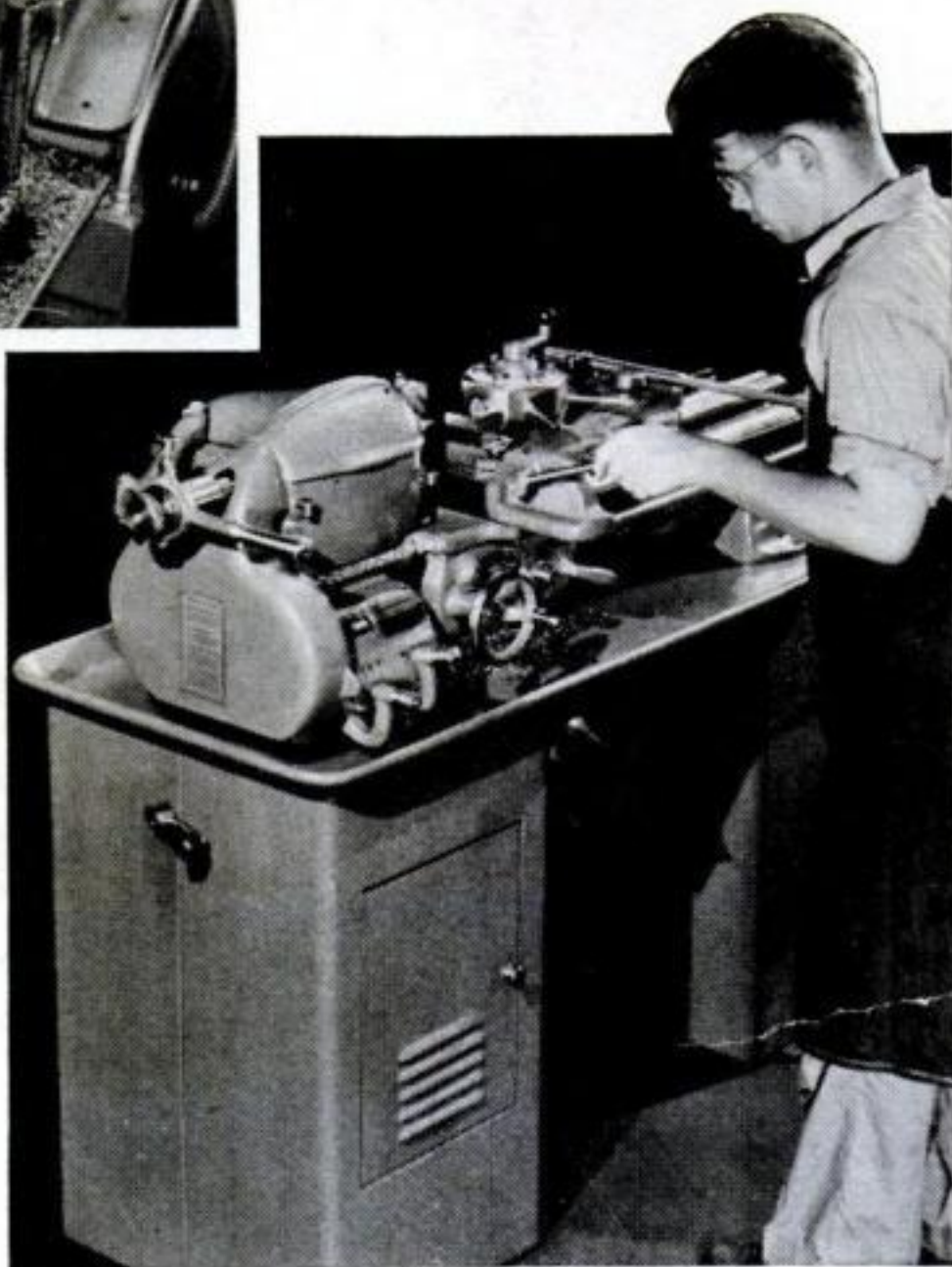


KEEP CLOSE-TOLERANCE MACHINING EFFICIENT!

South Bend PRECISION TURRET LATHES

South Bend 2-H Precision Turret Lathe—1" collet capacity, 16 1/4" swing, 96 power turret feeds, 48 cross slide feeds, 48 carriage feeds, 48 thread cutting feeds.

South Bend Precision Turret Lathes keep efficient the machining of small duplicate parts. Their remarkable accuracy and positive controls simplify the holding of close tolerances with only normal machine handling care. Finishes are commonly produced that otherwise would require additional operations. Simplicity of tooling makes job changes quick and economical. Wide ranges of power feeds and thread cutting feeds assure maximum efficiency on every job. They are particularly suited for second operations. Available in 3 sizes: 1" collet—16" swing; 1" collet—10" swing; 1/2" collet—9" swing.



South Bend CL930-Z Precision Turret Lathe—1/2" collet capacity, 9 1/4" swing, 48 carriage feeds, 48 thread cutting feeds, handlever cross slide, handlever turret.



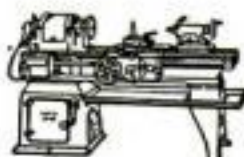
SOUTH BEND LATHE

South Bend 22, Indiana
Building Better Tools Since 1906

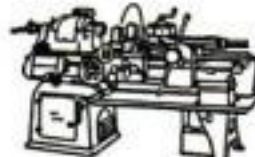
Send Information Checked:



☐ 9" and 10" BENCH LATHES



☐ 10" to 16-24" FLOOR LATHES



☐ 1/2" and 1" Collet TURRET LATHES



☐ 14" DRILL PRESSES



☐ 7" BENCH SHAPERS

Name _____ Company _____

Street _____ City & State _____

YOU'RE SET...

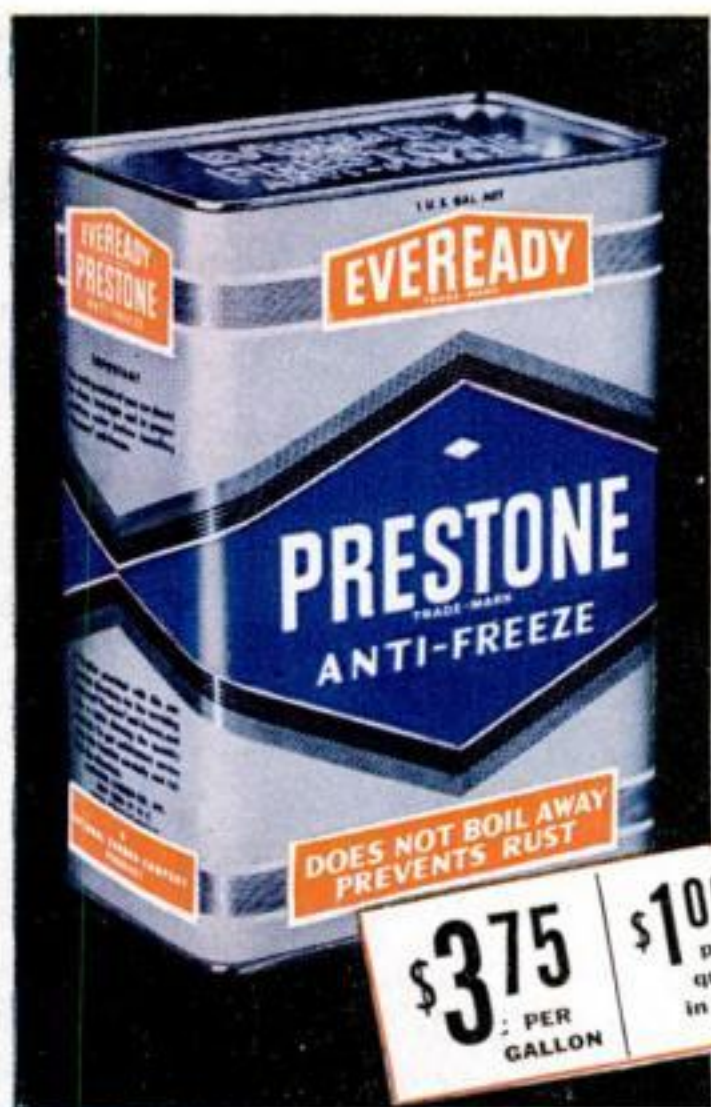
You're set for the whole winter!
Just put "Prestone" anti-freeze in and forget it till spring!

YOU'RE SAFE...

You're safe from both boil-offs and freeze-ups!
No worry—no repair bills!

YOU'RE SURE...

You're sure you have the best! It's America's
No. 1 anti-freeze! It's guaranteed!



WITH
“PRESTONE”

BRAND
ANTI-FREEZE

One shot lasts all winter!

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation

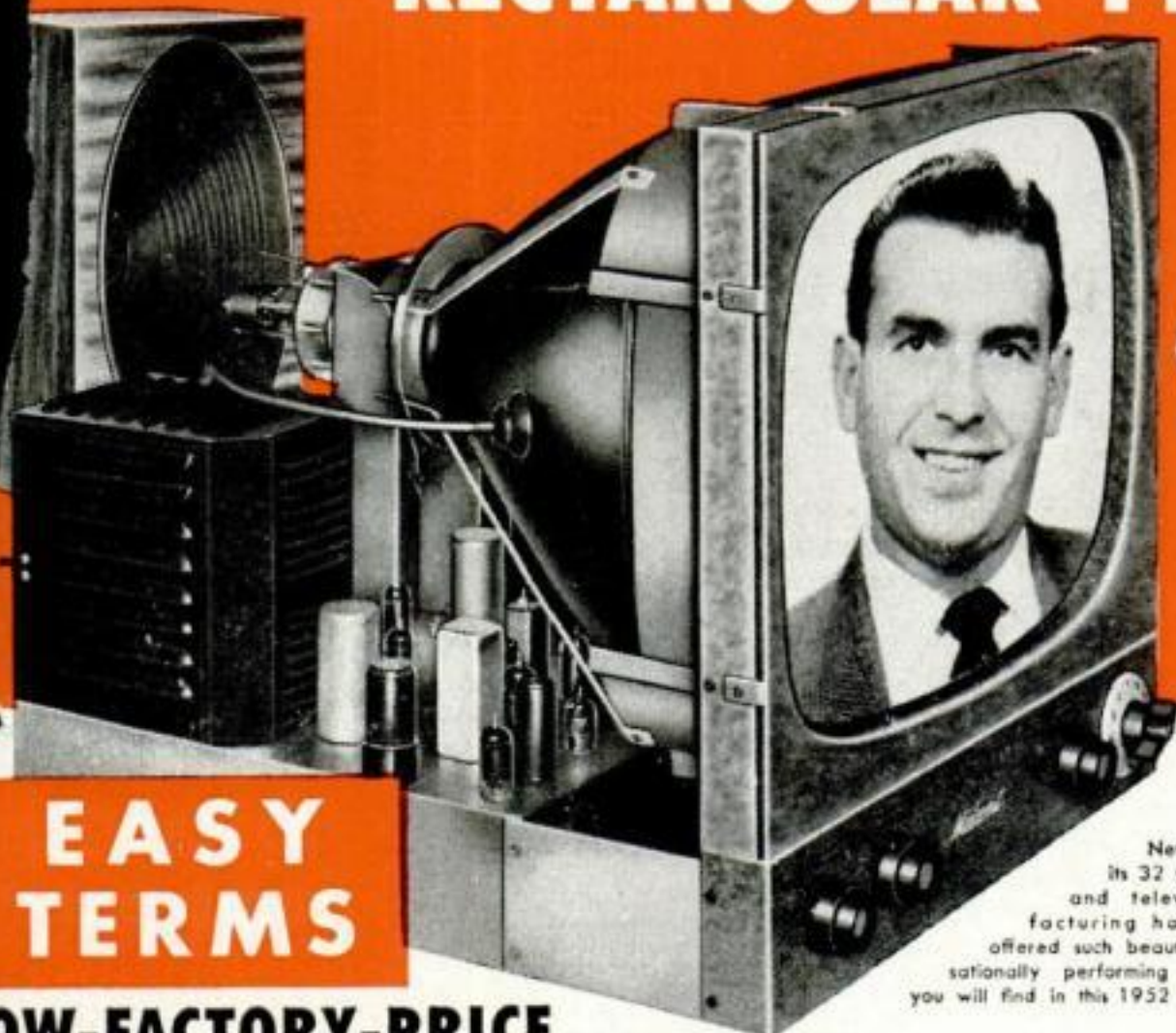
30 East 42nd Street, New York 17, N. Y.

The terms "Prestone" and "Eveready" are registered trade-marks
of Union Carbide and Carbon Corporation

MIDWEST *Presents for 1952* TELEVISION and RADIO



Featuring the Mammoth **20-Inch**
RECTANGULAR PICTURE TUBE



1952 MIDWEST
20-Inch
TELEVISION
CHASSIS
For Easy Installation
In Your Own Cabinet

**EASY
TERMS**

Never before in
its 32 years of radio
and television manu-
facturing has MIDWEST
offered such beautiful, such sen-
sationally performing receivers as
you will find in this 1952 Midwest Line.



Buy DIRECT and SAVE!

30 DAYS TRIAL

New 1952 "CONSTELLATION"
20-Inch TELEVISION Console

New "VIDEO GRAND"
20-Inch TELEVISION · RADIO
· PHONOGRAPH Console



Plus Powerful New 1952
World-Ranging 5-Band
MIDWEST
RADIOS

In Beautiful Consoles and
Complete Chassis



FACTORY-TO-YOU

An entirely new radio line featuring
the powerful Series 16 AM-FM Five-
Band Radio Chassis, and the Mag-
nificent Symphony Grand Radio-
Phonograph with 3-Speed Auto-
matic Intermix Record Player.

EASY TERMS

